The Journal
OF THE KANSAS MEDICAL SOCIETY

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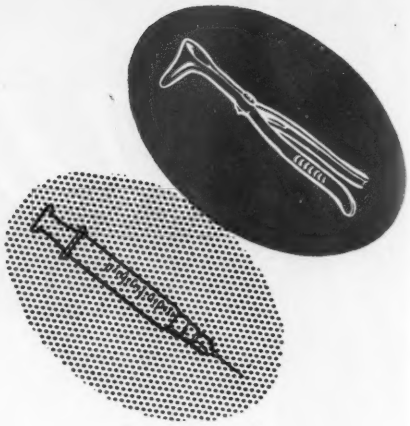

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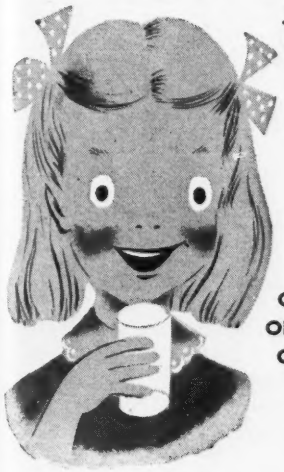

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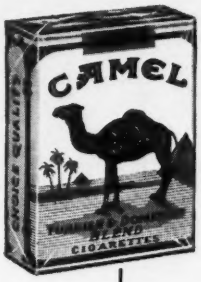

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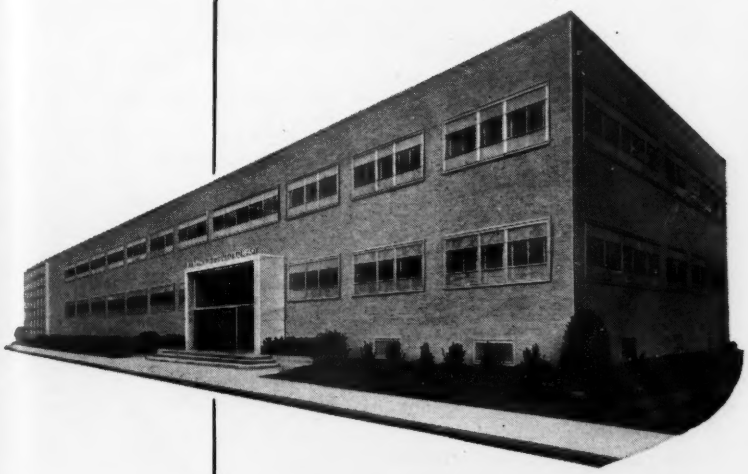

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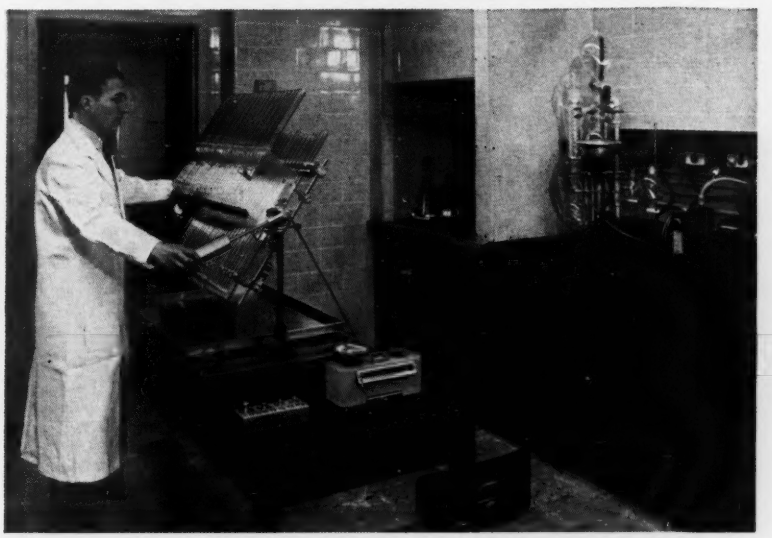

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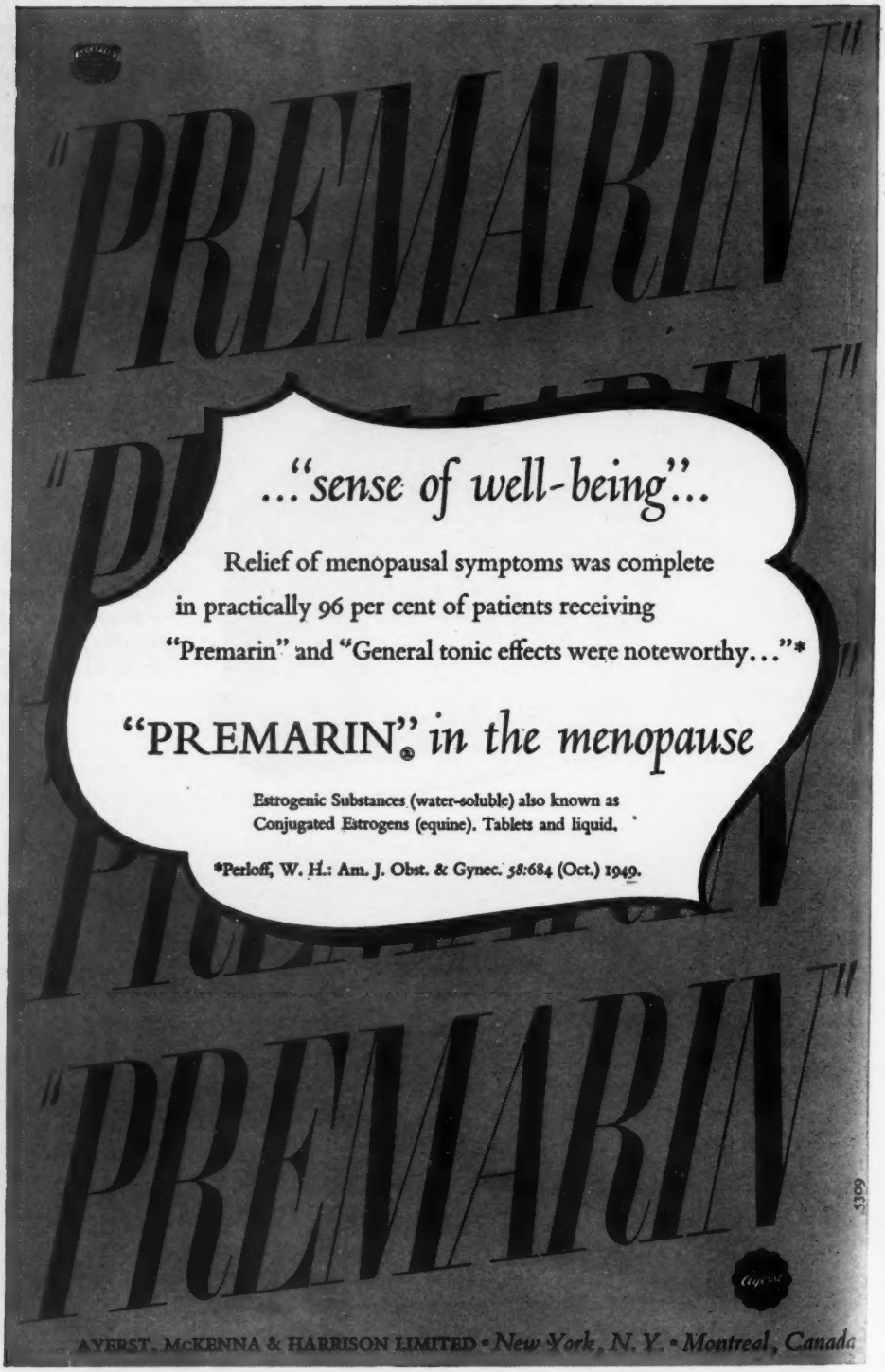
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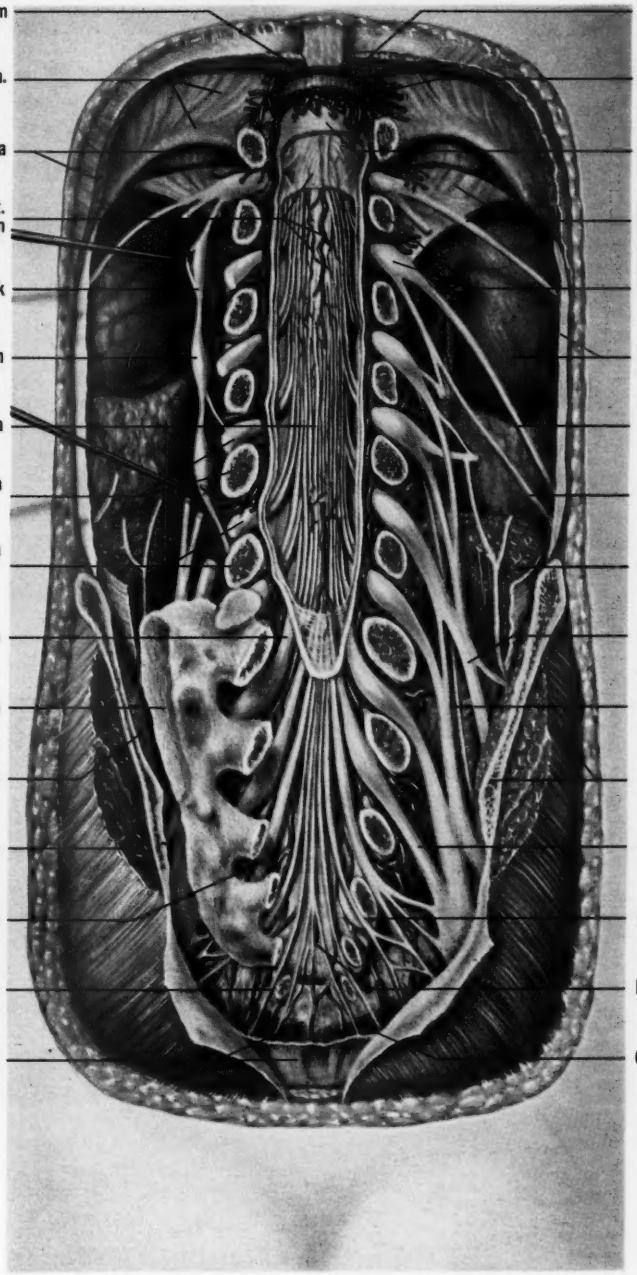

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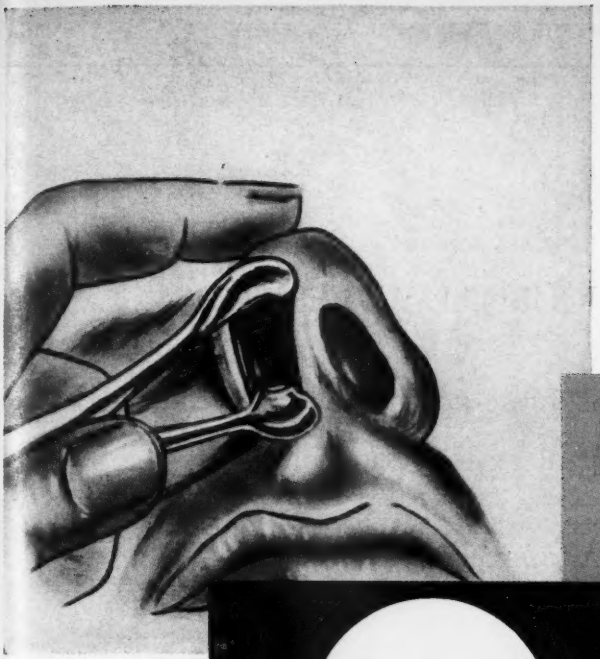

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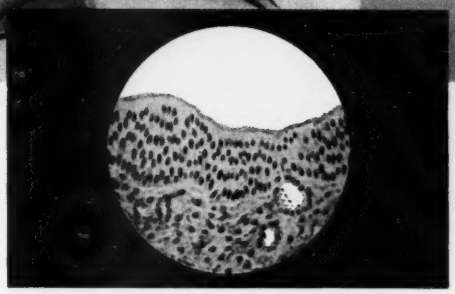

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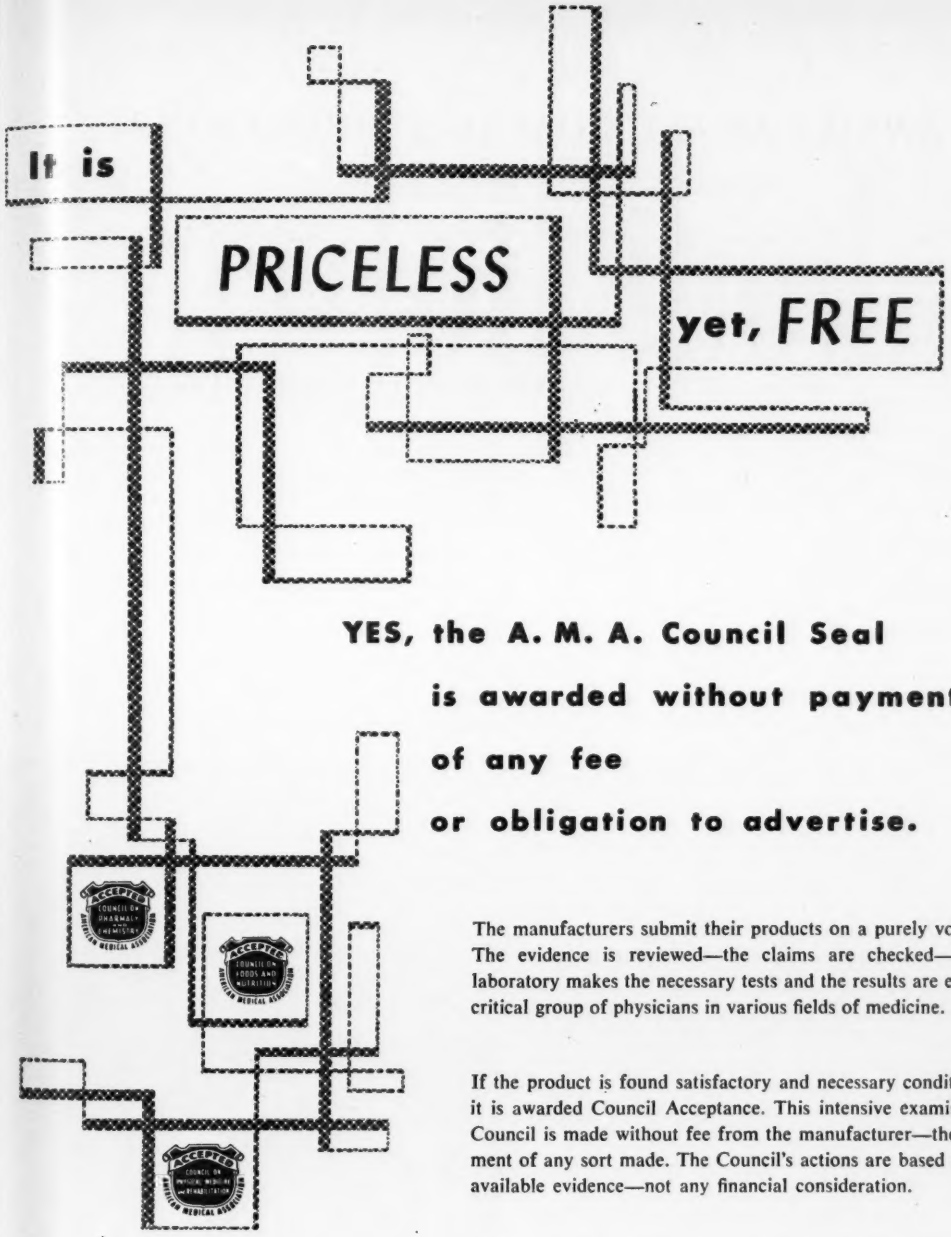

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Volume LIV NOVEMBER, 1953 No. 11

The Peptic Ulcer Problem: A Review of 516 Surgical Cases*

R. L. Sanders, M.D.
Memphis, Tennessee

This review, covering our experience with surgical peptic ulcers over the past 10 years, is presented in illustration of our conception of the indications for operation and the surgical procedures most applicable to the various types of ulcers. Between January 1, 1943, and January 1, 1953, we operated upon 516 patients with peptic ulcer. Twenty-nine had gastrojejunal, 56 gastric, and 431 duodenal lesions, all benign. Of the 516, 402 were males and 114 were females (Table I).

TABLE I

SEX INCIDENCE OF 516 PATIENTS WITH SURGICAL PEPTIC ULCER

Males	402 (78%)
Females	114 (22%)

DUODENAL ULCER

The 431 patients with duodenal ulcers represent 20.7 per cent of a total of 2,079 of those with duodenal ulcer observed during the same period. The majority were referred for operation by their home physicians after having been treated for a number of years, with little or no benefit. We have consistently endeavored to observe the established principle that only those ulcers which have acutely perforated and those which have proved intractable to medical management, are persistently obstructive, or dangerously hemorrhagic are suitable for surgical treatment. The incidence of these complications in the cases under review may be seen in Table II.

TABLE II

SURGICAL COMPLICATIONS OF DUODENAL ULCER

431 Cases—10 Years

Obstruction	151 (35.0%)
Bleeding	90 (20.9%)
Obstruction and Bleeding	54 (12.5%)
Intractability	104 (24.0%)
Acute Perforation	32 (7.0%)
Total	431

Perforation. The perforation of anterior wall ulcers may give rise to an acute abdominal catastrophe or may be protected by the surrounding tissues. Fortunately, the majority are of the latter type.

Every physician is familiar with the classic symptoms and signs of an acute perforation of a peptic ulcer, particularly the excruciating pain and the board-like rigidity and exquisite tenderness of the abdomen. The necessity for immediate operation in such cases is also well known. After a few hours the patient may seem slightly more comfortable, though the abdominal tenderness and rigidity persist and a plain film usually reveals gas beneath the diaphragm. If surgery is not undertaken at this stage, the signs of peritonitis may soon appear.

Thirty-two (7.4 per cent) of the patients in this group of 431 had acute or unprotected perforations (Table II). Sixty-eight (15.8 per cent) apparently had protected perforations, making a total of 100 with perforations, or almost one-fourth of the 431 patients (Table III). Two of those with acute perforation had had a perforation previously, one of them on two occasions. The latter patient was treated

* Presented at the 95th annual session, Kansas Medical Society, Wichita, Kansas, May 3-7, 1953.

TABLE III

FINDINGS AT OPERATION FOR DUODENAL ULCER

431 Cases

	Multiple Ulcers	*Protected Perforation*
Bleeding Ulcers (90)	33	10
Obstructing Ulcers (151)	67	32
Bleeding and Obstructing (54)	24	11
Intractable Ulcers (104)	25	15
Acutely Perforating Ulcers (32)	2	
Total	151	68

by subtotal resection; all the others were treated by simple closure of the perforation.

Acute perforations of ulcers are notorious for their high mortality, a fact which affords the best possible reason for early operation. Five (15.6 per cent) of these 32 patients died postoperatively. In one of these, the perforation had been present for 70 hours; the patient had generalized peritonitis and was in extremis on admission to the hospital. Another, whose perforation was of four days' duration, developed multiple subphrenic and abdominal abscesses, with peritonitis and disruption of the wound. A third, whose perforation had been present for 72 hours, had a generalized peritonitis at operation and subsequently developed a subphrenic abscess followed by disruption of the wound. The fourth had a perforation of seven hours' duration. A large subphrenic abscess developed and, though drainage was established, the patient succumbed from sepsis and exhaustion. The fifth patient was admitted to the hospital seven hours after the perforation; he was in a state of shock on admission and died a few hours postoperatively without recovering from the shocked condition. The last patient was operated upon in 1947, the other four in 1943 and 1944. In part, we attribute the recovery of all patients with acutely perforating ulcers within recent years to the use of antibiotics. Earlier surgery, however, might have saved all these patients.

Intractable Ulcer. On the whole, duodenal ulcers which are commonly called intractable present the most difficult of all problems concerned with the decision to operate. The outstanding feature of this group is more or less severe and persistent pain or discomfort. The association of some degree of hemorrhage or obstruction, or both, is not uncommon. High acid values is the rule rather than the exception. The patient with such an ulcer is usually extremely nervous, and either incapable of being relieved by medical treatment or unable, for business or financial reasons, to follow the required regimen.

One hundred four, or 24 per cent, of the ulcers in this group fell into the category of intractability (Table II). The period of treatment had varied from 2 to 26 years, which was sufficient to discourage both the patients and their physicians. Several requested surgery because of inability to follow the prescribed medical regimen. Seventeen had had a previous acute perforation which had been closed surgically. Many others had a mild degree of obstruction or gave a history of bleeding on at least one occasion. At operation, a protected perforation or multiple ulcers or both, were found in 34 patients, 25 having multiple ulcers and 15 chronic perforations (Table III).

Obstruction. Healed ulcers, usually situated on the anterior wall, often produce obstruction from scar tissue contracture which can be relieved only by surgery. Patients with such ulcers give a history of constant or recurrent symptoms covering many years, and the majority have low acid values. Frequently, however, either an anterior or posterior ulcer, or both together, produce obstruction incident to inflammatory changes. In any case of obstruction, the presence of an anterior lesion should lead one to suspect another on the posterior wall.

Of our 431 patients, 205 (47.5 per cent) had ulcers which were producing moderate to complete obstruction. Fifty-four of these also gave a history of bleeding of mild to moderate degree (Table II). A total of 91 were multiple and 43, many of them in the multiple group, were associated with chronic perforation (Table III).

Hemorrhage. Patients with mildly hemorrhagic ulcers can usually be carried along indefinitely on medical treatment, even though the bleeding may be recurrent. We have limited surgery to those in whom the bleeding has been free on two or more occasions or is associated with obstruction or persistent pain.

Of these 431 patients, 144 (33.4 per cent) had chronically bleeding ulcers. Hemorrhage was the chief basis for operation in 90 of the 144 (Table II). Thirty-three of the 90 had multiple ulcers, and 11 had a protected perforation of an anterior ulcer (Table III). The hemorrhage was coming from an anterior ulcer in 55 (38 per cent) of the 144, though in general the severely bleeding lesions were on the posterior wall.

In the presence of massive hemorrhage, the decision to operate will depend upon several considerations. In patients under 45 years of age, a clot will usually form and close the opening. We believe surgery is indicated only if transfusions and other supportive treatment fail to control the bleeding and raise the blood pressure to a satisfactory level within 36 to 48 hours. Especially is this true if the hemorrhage is the first evidence of ulcer and the patient has had no opportunity to try medical treatment. If the ulcer is of long standing, however, and medical measures have been given an adequate trial, we believe operation is advisable as soon as the pa-

tient sufficiently recovers from the effects of the hemorrhage. In any case, a second massive hemorrhage is a definite indication for surgical intervention.

In older persons, on the other hand, the arteries are less elastic, and the formation of a clot is less likely. It is best to operate on these patients within 12 to 24 hours unless continuous or repeated transfusions bring about a definite improvement; even then, operation should be performed as soon as possible after the hemorrhage ceases. Reports of large series of cases have shown that operations for massive hemorrhage in individuals over 45 years of age carry a high mortality, especially if the procedure is delayed beyond the first 24 hours after the onset.

Four of these patients had massively bleeding ulcers, though only one was operated upon during the hemorrhage. This was a woman aged 32 years, who was referred because of almost continuous bleeding for two weeks, despite 17 transfusions. She had bled constantly for 7 hours prior to admission to the hospital, and her red blood cell count was only 2,000,000. Because of her age and failure of the hemorrhage to respond to transfusions, a subtotal resection was performed. She had a smooth postoperative course and has remained well since the operation, now almost five years ago.

TABLE IV

OPERATIONS FOR DUODENAL ULCER

	431 Cases
Resection	208 (48.2%)
Gastroenterostomy and Vagotomy	137 (31.7%)
Gastroenterostomy	49 (11.0%)
Closure Perforation	31 (7.2%)*
Vagotomy	5 (1.1%)
Pyloroplasty and Vagotomy	1 (0.23%)
Total	431

* One perforating ulcer treated by resection.

In Table IV are shown the types of operations employed in these 431 cases. Almost all the vagotomies, alone and with gastroenterostomy, were performed during a three-year period from the latter part of 1946 to the latter part of 1949. Our experience with this procedure has been similar to that reported by other surgeons: the immediate results were spectacular, though too many of the patients had recurrent difficulty of more or less severity. For this reason, we have practically abandoned the use of vagotomy for primary duodenal ulcer, considering it suitable only for patients with excessively high acids, and then only in combination with resection or gastroenterostomy.

It will be observed that of the 431 patients with duodenal ulcer, 208, or 48.2 per cent, had a gastric resection. For the past three years we have employed resection in 93 per cent of our cases, with the exception of those with acute perforation. It is worth mentioning that 51 patients (25 per cent) for whom a resection was performed had previously been operated upon for duodenal ulcer.

The technique of resection in these cases has been varied according to the requirements of each case. As a rule, we resect 50 to 65 per cent of the stomach. Only in the presence of excessive acids or a severe gastritis is more than this amount removed. Also, for ulcers situated so low in the duodenum as to preclude their safe removal, we have preferred to divide the duodenum above the lesion, leaving it undisturbed, but always have included the entire pylorus and the antral mucosa in the 65 per cent resection.

With the exception of the 32 who had acute perforations, a total of 399 patients were operated upon for intractable, obstructive, and hemorrhagic ulcers. In this group there were 2 fatalities, or approximately .5 per cent. The total of 7 fatalities in the entire 431 cases, including those with acute perforation, was 1.6 per cent (Table V).

TABLE V

MORTALITY FOLLOWING OPERATIONS FOR DUODENAL ULCER

	431 Cases
Acute perforation (32)	5 (15.6%)
All others (399)	2 (0.5%)
Total	7 (1.6%)

One of the patients who succumbed, a man aged 56, had been treated for a duodenal ulcer for 20 years and had recently had mild bleeding. Following a gastroenterostomy and vagotomy, his progress was excellent, and he was walking about. On the seventh day, however, he had a sudden seizure and died within five minutes, apparently from a massive pulmonary embolism.

The second of these patients, a man aged 45, had been on a medical regimen almost constantly over a period of 12 years and had persistently refused operation. On exploration, a large, penetrating and obstructing posterior ulcer with a perforated but protected anterior ulcer was found, and a resection was performed. Acute pancreatitis with fat necrosis and infection, as shown by autopsy, were believed primarily responsible for the fatal outcome. In both these cases, we felt that medical treatment had been overdone.

GASTRIC ULCER

Of the 56 patients of this series who had gastric ulcer, 24 had an ulcer on the duodenal side of the pylorus as well (Table VI). Five had been operated upon previously for duodenal ulcer. None of these

TABLE VI

COMPLICATIONS OF GASTRIC ULCER

56 Cases	
Associated duodenal ulcer	24
Bleeding	11
Perforation	10

patients have been included among the 431 with duodenal ulcer alone.

Eleven of the 56 patients gave a history of bleeding, and in 10 the ulcer appeared to have perforated. One of the latter had a liver abscess. One patient had three gastric ulcers, all on the lesser curvature.

We look upon gastric ulcer as a surgical condition. It is our belief that prolonged or even a short period of medical treatment is rarely justified, in that almost 20 per cent of ulcers in this location prove to be malignant. The roentgenologist is seldom able to determine whether the lesion is benign or malignant, and not infrequently the pathologist has difficulty in making the distinction after the specimen has been removed.

A gastric resection was performed in all these patients, with one exception. This was a man aged 45, who had a bleeding gastric ulcer which was perforating into the omentum, associated with multiple duodenal ulcers and complete obstruction of the pylorus. His condition was further complicated by advanced heart disease. A gastroenterostomy was performed. He died following the operation, heart disease being the chief cause of death. This was the only fatality in the group of patients with gastric ulcer and constitutes a mortality of approximately 2 per cent of the 56.

GASTROJEJUNAL ULCER

The majority of gastrojejunal ulcers develop following gastroenterostomy in patients with high acid values and without obstruction of the pylorus. The symptoms are similar to those of duodenal ulcer, although the pain is slightly lower and more to the left. They may appear at any time from a few weeks to many years after the operation. One of our patients came to operation 25 years and another 27 years following the previous operation.

Since medical treatment gives only temporary relief of the symptoms of gastrojejunal ulcer, we regard surgery as imperative as soon as the patient can be prepared. The necessity for operation is increased in the presence of bleeding or the demonstration of an associated active duodenal ulcer. Signs of perforation onto the transverse mesocolon or into the transverse colon or peritoneal cavity demand immediate surgical treatment.

For gastrojejunal ulcer in patients who have had a gastroenterostomy, we consider disconnection of the stoma and high subtotal resection the procedure of choice. In patients with excessive acids, the addition of a vagotomy may be of value. Following a previous gastric resection, a higher resection is usually advisable, though if the patient presents a poor risk, a vagotomy alone may be expedient. Or, at times, it may be necessary to compromise with some other procedure. For example, one of our patients who had had a subtotal resection for duodenal ulcer six weeks previously, entered the hospital a second time with an acutely perforating gastrojejunal ulcer and generalized peritonitis. Because of his extremely dangerous condition, the ulcer was simply closed. A jejunostomy was formed for feeding purposes. When last observed, five months postoperatively, he was free of symptoms and eating well.

TABLE VII

GASTROJEJUNAL ULCER

Previous Operations—29 Cases	
Resection	5
Gastroenterostomy only	18
Gastroenterostomy and Vagotomy	6

Table VII shows the operations previously performed in this group of cases, and in Table VIII are those employed for the gastrojejunal ulcers.

TABLE VIII

OPERATIONS FOR GASTROJEJUNAL ULCER

29 Cases	
Resection	19
Re-resection	2
Disconnection Gastroenterostomy	4
Vagotomy only (previous Gastroenterostomy)	3
Closure Ulcer and Jejunostomy	1
Total	29

As will be seen, there was one fatality following resection for gastrojejunal ulcer (3.5 per cent.). The patient was a woman aged 54, who had had a gastric resection with a Polya anastomosis for a large subacute and partially obstructing duodenal ulcer. Two months later, she was readmitted to the hospital with a gastrojejunal ulcer and colon fistula, complete obstruction of the colon, and a perforation into the peritoneal cavity admitting two fingers. The colon fistula was closed, the obstruction released, several inches of the jejunum were removed, and the stoma was reset. Again, two months after the second operation, she entered the hospital with a large abscess secondary to another perforation. The jejunal anastomosis had separated almost throughout, and a considerable portion of the gastroenterostomy had also separated. The jejunum and stomach were re-resected

and a Hofmeister type of anastomosis was made. The abscess was drained. Following this operation, her progress was fairly satisfactory for a few days; thereafter, the stomach contents began to drain from the incision, indicating a third perforation, and she died within a few days. Perhaps a vagotomy at the initial resection would have helped to reduce the stomach acids in this patient and prevented the formation of a gastrojejunal ulcer. At the second and third operations, her condition was so nearly moribund as to preclude the additional surgery incident to vagotomy. This is the only case we have ever seen of three perforations of a gastrojejunal ulcer following resection.

COMMENT

From these and previous experiences with duodenal ulcer, together covering approximately 900 operations, two points appear to be outstanding:

First, to make a diagnosis of duodenal ulcer is one thing, and to know when to operate is quite another. A simple ulcer with which the patient can live in comfort with reasonable care requires no surgery. A complicated ulcer which continues to incapacitate the patient over a period of years, however, is not a simple ulcer. To persist in delaying operation in such cases is as unsound in principle as to operate without adequate justification. Herein lies a fruitful field for the combined efforts of the physician and the surgeon.

Second, the ultimate result depends largely upon the choice of the operation. At present, there is a trend toward resection for acute perforations, provided the patient's condition permits. In the majority of cases, however, we feel that the immediate necessity of saving the patient's life calls for nothing more than closure of the perforation. The ultimate result is a secondary consideration, even though a large number of those who have a closure alone may be expected to require a subsequent operation. We have had no experience with non-surgical treatment of acutely perforating ulcer, as recommended by the English.

Time has not altered the usage of gastroenterostomy for cicatrizing obstructive ulcers. Otherwise, the indications for this procedure have been limited chiefly to poor risk patients, particularly if elderly, with inflammatory ulcers which are persistently obstructive.

With the foregoing exceptions, the whole idea of surgery for duodenal ulcer is to rid the patient of his disease at one stroke, so he may have no further difficulty from either the ulcer or postoperative complications. Gastric resection to an extent commensurate with the amount of acids present in the individual patient has proved to be the operation which best accomplishes this objective.

Toxemia of Pregnancy*

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Toxemia of pregnancy has long been the principal cause of maternal deaths in North Carolina. Indeed, the South is often referred to as the "toxemia belt," because of the unusual incidence of toxemia and severe forms of the hypertensive complications of pregnancy in this section of the country. Because deaths from toxemia occur predominantly among the indigent and underprivileged classes, it is often thought to be primarily a disease of "ill housed, ill fed and ill clothed women." The truth is, however, that toxemia occurs in all races and classes, without regard for economic and educational status. Any physician who does obstetric practice is constantly faced with the problem of hypertension, albuminuria, or edema occurring at various stages of pregnancy.

By definition, the toxemias of pregnancy are disorders encountered during gestation or in the early puerperium, and characterized by one or more of the following signs: hypertension, edema, albuminuria and, in severe cases, convulsion and coma.

Hypertension is defined as the presence of a systolic blood pressure of 140 mm. of mercury or above, and a diastolic pressure of 90 mm. In a patient who was previously hypotensive or hypertensive, a rise of 30 mm. or more in the systolic pressure or 15 mm. or more in the diastolic is evidence of acute toxemia. Albuminuria developing in a patient with chronic hypertension is also evidence of superimposed toxemia of pregnancy.

CLASSIFICATION

The difficulty of classifying the hypertensive complications of pregnancy is indicated by the large

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number of classifications which have appeared in the past. For many years all obstetricians and teaching centers employed their own classifications. The presentation of an acceptable classification of toxemia of pregnancy by the American Committee on Maternal Welfare (Table 1) has been a major contribution to the welfare of this group of obstetric patients.

TABLE 1

CLASSIFICATION OF TOXEMIA OF PREGNANCY ADVOCATED BY THE AMERICAN COMMITTEE ON MATERNAL WELFARE

I. Acute toxemia of pregnancy
   A. Pre-eclampsia
      1. Mild
      2. Severe
II. Chronic hypertensive (vascular) disease with pregnancy
   A. Chronic hypertensive vascular disease without superimposed acute toxemia
      1. Those cases in which hypertension was definitely known to exist before the onset of pregnancy
      2. Cases in which hypertension was discovered before the twenty-fourth week
   B. Chronic hypertensive vascular disease with superimposed acute toxemia

Group I. This classification includes the acute toxemias of pregnancy, subdivided into pre-eclampsia, mild and severe, and eclampsia. All the patients in this group are normal prior to pregnancy, and the hypertensive syndrome develops as an acute phenomenon. Mild cases, by definition, are those in which the blood pressure is below 160 systolic and 100 diastolic and the urine contains less than 0.6 Gm. of albumin per 100 cc. We are not in full accord with the designation "mild pre-eclampsia" for these cases, since it implies that the patient is not in danger. Some obstetricians believe that mild pre-eclampsia does not progress into the severe form, or into eclampsia. Our experience is quite contrary to this opinion.

Group II. The second major group in this classification is made up of patients who have chronic hypertensive (vascular) disease with pregnancy superimposed. These cases are divided into those in whom hypertension is definitely known to exist before pregnancy, and those in whom hypertension appears before the 24th week of pregnancy. The latter group is further subdivided into cases with and without evidence of superimposed acute toxemia.

The newest classification of toxemia which was adopted by the American Committee on Maternal Welfare in 1952 entirely omits renal diseases as such. This omission simplifies the classification and does away with many confusing points. This classification shows that all types of toxemia have a common factor —that of a vascular disorder.

THE IMPORTANCE OF AN ACCURATE DIAGNOSIS

Management of toxemia. The primary objectives in the management of all cases of toxemia are: (1) to avoid eclampsia, abruptio placentae, and additional vascular or renal accidents contributing to maternal mortality; (2) to obtain a living child, and to reduce the fetal hazards resulting from toxemia to an absolute minimum; (3) to prevent, if possible, the development of a fixed or increased hypertension following the termination of pregnancy.

Since the management of all cases of toxemia, as well as the prognosis for both mother and child, depends chiefly upon an accurate diagnosis of the fundamental lesion present, it is essential to determine correctly the classification of each patient with a hypertensive complication of pregnancy. We all recognize the difficulty of classifying satisfactorily the disease of some of our patients. However, there is little question that a careful study of the patient, employing the usual clinical and laboratory methods, will lead to a reasonably accurate diagnosis, and in turn will give one some idea of the response to be expected from the treatment.

In general, we may expect a satisfactory response to conservative therapy in most patients with pre-eclampsia. We may also expect a reasonable response in those cases of chronic hypertensive vascular disease with superimposed acute toxemia of pregnancy. However, cases of severe chronic hypertensive vascular disease without superimposed toxemia of pregnancy usually respond to treatment poorly, if at all.

At times the decision concerning the management of these patients with toxemia is difficult. Severe hypertension with evidence of renal damage may be present when the infant is very near the period of viability, and the family may be determined to take unusual risks in their great desire for a child. When severe renal disease is observed at the onset of pregnancy, or when moderate degrees of toxemia occur in a patient at term or actually in labor, there is usually no question as to the proper management. However, less clear cut problems are more common.

INCIDENCE OF TOXEMIA IN NORMAL AND HYPERTENSIVE WOMEN

The incidence of toxemia of pregnancy in patients admitted to the North Carolina Baptist Hospital is comparable to that in other institutions. The period from 1945 to 1947 is typical (Table 2). During this time, 3,202 deliveries occurred in the hospital and 258 patients had significant degrees of toxemia. This incidence of 8.0 per cent means that one out of every 12 obstetric patients admitted required special consideration because of a hypertensive complication of pregnancy. During this period, chronic hypertensive

TABLE 2

THE INCIDENCE OF TOXEMIA OF PREGNANCY AT THE NORTH CAROLINA BAPTIST HOSPITAL, 1945-1947

Year	*Deliveries*	*Cases of Toxemia*	*Incidence of Toxemia*
1945	930	94	
1946	1160	99	
1947	1112	65	8.0
Total	3202	258	

disease made up 30 per cent of the cases of toxemia seen in the North Carolina Baptist Hospital (Table 3). From 1948 through 1952, there were 6,255 deliveries with 627 cases of toxemia, an incidence of 10 per cent. Patients with chronic hypertensive vascular disease have continued to represent 20 to 30 per cent of the toxemic group.

TABLE 3

CLASSIFICATION OF TOXEMIAS OF PREGNANCY SEEN IN THE NORTH CAROLINA BAPTIST HOSPITAL, 1945-1947

Type of Toxemia	*No. of Cases* 1945	1946	1947	*Total*	*Incidence*
Type 2					
HCVD				54	20.9%
Benign	10	23	18-51		
Malignant	1	1	1- 3		
Glomerulonephritis				7	2.7%
Acute	1	0	1- 2		
Chronic	3	2	0- 5		
Pyelonephritis	7	6	5	18	7.0%
Type 1					
Pre-eclampsia	66	63	39	168	65.0%
Eclampsia	4	2	0	6	2.3%
Unclassified	2	2	1	5	2.0%
Total	94	99	65	258	100.0%

HAZARDS OF PREGNANCY IN WOMEN WITH CHRONIC HYPERTENSION

It is generally conceded that the incidence of superimposed toxemia of pregnancy varies from 25 to 50 per cent in patients who have chronic hypertensive disease.

Although acute toxemia of pregnancy is largely preventable in normal women who have satisfactory prenatal care, it is often impossible to prevent the progression of hypertension during pregnancy in women with chronic vascular disease, and the incidence of superimposed pre-eclampsia, abruptio placentae, stillbirths and maternal deaths is greatly increased in such women. The classic study made by Corvin and Herrick[1] in 1927 supports this view. These authors concluded:

"Very few women who begin pregnancy with a blood pressure above 150 systolic or 100 diastolic can go through pregnancy successfully, that is, with a living child. It is our opinion, moreover, that pregnancy does much to accelerate the progress of chronic cardiovascular disease, that it may bring it out when latent and it is to be avoided when the disorder has made evident inroads."

Chelsey and Cosgrove[2] studied 301 pregnancies occurring in 218 patients with vascular disease (Table 4). Even in the cases without superimposed toxemia, the fetal loss was 18.5 per cent. When toxemia was superimposed, the fetal loss was 50 per cent, and the incidence of other serious complications was greatly increased. These authors stated:

"In cases which we recognize as pure hypertensive, about half go through the entire pregnancy with

TABLE 4

INCIDENCE OF COMPLICATIONS IN 301 PREGNANCIES OCCURRING IN 218 PATIENTS WITH VASCULAR DISEASE (CHELSEY AND COSGROVE)

	In Cases With No Superimposed Toxemia	*In Cases With Superimposed Toxemia*	*In All Cases*
Fetal loss	18.5%	50.0%	38.2%
Abruptio placentae	3.8%	10.0%	5.6%
Eclampsia	0	10.0%	3.0%
Immediate maternal mortality	0	6.7%	2.0%
Late puerperal deaths (1 to 4 months)	0.9%	5.5%	2.3%

essential constant blood pressure level. In the other half, various changes or combination of changes are seen; in nearly 40 per cent the blood pressure drops late in the first trimester, usually to return to the initial level, or a higher one, in late pregnancy. Occasionally, this drop will bring the pressure down within normal range so that in the absence of a reliable history the late rise will be interpreted as pre-eclampsia. In about 10 per cent of the cases, the blood pressure rises above its original average level early in the second trimester. This is most ominous for fetal prognosis. In these cases who have marked proteinuria or proteinuria with increased hypertension or edema in conjunction with either of the other triads of symptoms, it is usually interpreted as a superimposition of toxemia on the original hypertension. This occurs in about one-third of hypertensive pregnancies."

Jones[3] reported the experience at the Providence, Rhode Island, Hospital in 1951. In 51,840 deliveries, there were 1,553 cases of toxemia. Two hundred forty-four of these patients had essential hypertension, which was considered benign in 203 of the cases. His analysis of this group of patients with so-called benign hypertension revealed the following increases in the usual incidence of complications:

1. Pre-eclampsia—14 times as frequent.
2. Abruptio placentae—10 times.
3. Cerebral hemorrhage or convulsion—20 times.
4. Fetal deaths—67 times.
5. Maternal death—35 times.

There is little question that in most cases of hypertensive cardiovascular disease the condition can be expected to progress during pregnancy, reducing the life expectancy of the patient. Since the chance of obtaining a live baby is seldom better than one in three, we do not advise any of these patients to attempt pregnancy, and the great majority of the therapeutic abortions which we perform are done in this group of patients.

MANAGEMENT OF PREGNANT PATIENTS WITH CHRONIC HYPERTENSIVE VASCULAR DISEASE

Every patient who shows any evidence of hypertension early in pregnancy should be carefully evaluated from the point of view of renal function. Al-

though a urinalysis which shows a specific gravity above 1.020 without formed elements or albumin is indicative of satisfactory renal status, we feel that such patients should be hospitalized for urea clearance studies, a phenolsulfonphthalein excretion test, concentration tests, and blood chemical determinations. It is unfortunate that we do not have a satisfactory method of determining whether the kidneys are able to sustain a pregnancy, or whether pre-eclampsia will be superimposed.

Therapeutic abortion is indicated if there is (1) evidence of renal damage; (2) hypertensive heart disease with roentgenographic evidence of cardiac enlargement or electrocardiographic changes; (3) changes in the retinas with old exudate or fresh hemorrhages; or (4) a previous history of superimposed toxemia during pregnancy, since this condition may be expected to recur in 71 per cent of the patients.

Patients with hypertensive vascular disease who are permitted to continue pregnancy must be made to understand the hazards to their own welfare and the poor chances of obtaining a live child. These patients should also understand that interruption of pregnancy may be necessary, whether or not the infant has reached the period of viability, if acute toxemia is superimposed. The prenatal supervision of such patients must be meticulous, and they must be checked at frequent intervals. In the first half of pregnancy they should be seen at least once every week or 10 days, and in the third trimester they must be seen twice each week. At each visit the blood pressure, weight, size of the uterus, and condition of the fetus should be recorded, and the urine should be studied for albumin. The patient should be instructed to rest at least one hour in the morning and one hour in the afternoon, and physical activity should be restricted.

Many hypertensive patients are obese, and their weight gain should be restricted. However, we believe that the caloric intake of all hypertensive prenatal patients should be held to a maximum of 1500 to 1800 calories, containing a minimum of 96 Gm. of protein, and that their sodium intake should be reduced to a maximum of 1.5 Gm. per day.

Whenever an increase in blood pressure or the appearance of albuminuria or edema gives evidence of superimposed acute toxemia, the patient should be hospitalized immediately for treatment and observation. We have been satisfied with the results of a regimen consisting of a high-protein, low-salt diet, sedation, and bed rest. The blood pressure is recorded four times daily; the fluid intake and output and the degree of albuminuria are recorded each day. If the patient responds to treatment, every effort is made to continue the pregnancy to the 32nd or 34th week in order to obtain a live infant. However, if her condition does not improve or if signs and symptoms become worse, labor must be induced.

It has been shown repeatedly that in women without previous vascular disease, the incidence of residual hypertension following pre-eclampsia is proportionate to the period of time elapsing between the onset of toxemia and delivery. When the duration of pre-eclampsia does not exceed four weeks, only about 20 per cent of the patients will have residual hypertension. If the pre-eclampsia lasts longer than six weeks, chronic hypertension develops in more than 60 per cent of the patients. In view of this serious effect of prolonged toxemia upon the normal individual, it can be seen that the danger to the patient who has chronic hypertension is excessive.

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All things are engaged in writing their history. The planet, the pebble, goes attended by its shadow. The rolling rock leaves its scratches on the mountain; the river, its channel in the soil; the animal, its bones in the stratum; the fern and leaf, their modest epitaph in the coal. The falling drop makes its sculpture in the sand or the stone. Not a foot steps into the snow or along the ground but prints, in characters more or less lasting, a map of its march. Every act of the man inscribes itself in the memories of its fellows, and in his own manners and face. The air is full of sounds, the sky of tokens, the ground is all memoranda and signatures, and every object covered over with hints which speak to the intelligent.—*Ralph Waldo Emerson.*

Cardiovascular Laboratory, University of Kansas Medical Center: Report of Activities of First 24 Months, May 1951-May 1953

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As a part of the general development program of the University of Kansas Medical Center, a Cardiovascular Laboratory was considered desirable and necessary. Adequate physical facilities for such a unit were included in the expansion of the Out Patient Clinic Building. Plans were made for 17 rooms, to include examining rooms, conference rooms, offices, laboratories, and special equipment rooms. This physical plant was completed in November, 1950, the necessary equipment being installed and personnel employed and trained by May, 1951.

The influence of such a unit on undergraduate teaching, patient care, research, and postgraduate teaching could be considerable. This report outlines only the patient care activities of the laboratory during its first 24 months. Research activities and teaching have been an integral part of patient care, and it would be difficult to decide where each began and ended. Any attempt to quantitate the work and responsibility of a considerable number of physicians and ancillary personnel over a 24-month period results in impersonal graphs and charts; the actual experience gained, mistakes made, and problems presented can only be inferred. Also, we appreciate that volume of work does not necessarily indicate quality of work.

This report is divided into four sections:

I. Diagnostic procedures.
II. Surgical procedures.
III. Residents and fellows.
IV. Grants.

Section 1 has been the responsibility of Doctors Dimond, Lin, Hall, and Diehl with the help of residents and fellows. Section 2 has been the responsibility of Doctors Schafer, Kittle, and Friesen.

I. DIAGNOSTIC PROCEDURES

a. *Electrocardiograms.* During this 2-year period, 13,546 electrocardiograms were recorded, mounted, and interpreted. The records have been 12 lead tracings, obtained on direct writing equipment. The original records have been filed in the laboratory; each record has been given a diagnostic code number, and a separate code file is maintained. The technician responsible for this area has been Miss Margaret Delich, assisted by Ilah Plumb, Frances Tague, Marjorie Krause, and Inez Claxton.

b. *Peripheral Vascular Studies.* A cork-lined, constant temperature room, equipped for peripheral vascular diagnostic studies, was included in the original planning of the unit. This area has been under the supervision of Dr. Stanley Morest with technical help from Inez Claxton. During the 2-year period, 10 Landis tests and 70 plethysmographic studies have been carried out. Studies of this nature have proved valuable, but very time consuming.

c. *Cardiac Catheterization.* Among the more difficult responsibilities has been the equipping of a cardiac catheterization unit and the training of personnel. This has been the only catheter team in the state, and the demand for its services has been heavy. The personnel responsible for catheterization have been Doctors Dimond, Lin, and Santos. The actual maintenance of equipment, determination of blood samples, and handling of records has been the responsibility of Mrs. Joyce Brewer, a superb technician.

In this 24-month period, 130 catheterizations of the right heart were accomplished. No deaths attributable to the procedure occurred. The principal complications were:

1. Temporary cardiac standstill with recovery, in one patient.

2. Temporary right bundle branch. We immediately terminated the procedure and the conduction returned to normal in 30 minutes, one patient.

3. Severe venous spasm, making its impossible to move the catheter for 2 hours, one patient.

4. Severe shaking chill immediately following the procedure, in one patient.

5. Fever immediately following the procedure, to 105°, a positive blood culture was obtained in one patient.

6. Subcutaneous hematoma, in the axilla, evidently due to puncture of subclavian vein by catheter. This resolved in two days without difficulty.

* Departments of Medicine and Surgery, University of Kansas Medical Center.

d. *Angiocardiography.* This technique has been given a minor role in our laboratory, with major emphasis placed on catheterization. A total of 26 dye studies have been made including translumbar aortagrams and peripheral arterio and venograms. Two deaths occurred during angiocardiography.

These studies have been done in conjunction with the Radiology Department with particular help from Dr. Galen Tice and Dr. Donald Germann.

e. *Ballistocardiograms.* This diagnostic procedure has been carried out several hundred times. The exact number of records obtained is meaningless; during the initial 18-month period experimental studies were carried out with the torsion ballistocardiograph with several hours frequently devoted to obtaining the record on a single patient. In the past six months a Sanborn model of the Dock Shin ballistocardiogram has been used. One hundred and twenty records have been obtained with this instrument. These records were not obtained for their particular diagnostic value, but primarily as an attempt to become acquainted with this field. This test has been the responsibility of Doctors Reissman, Santos, Dimond, and Lamb.

f. *Consultations.* The group has seen 3,766 patients in consultation. No attempt has been made to develop a large out-patient service, but instead a consultation type of service has been developed. On each of these patients, cardiac work-up has included fluoroscopy and electrocardiogram.

A separate, special hypertension clinic under the guidance of Doctors Dimond and Gunn has been established. This clinic consists of a "colony" of patients with a primary diagnosis of essential hypertension. This special clinic is maintained for the purpose of providing a pool of patients with whom we have long range contact and rapport, thus providing an ideal group for testing the efficiency of new hypotensive agents. Nine hundred and forty-nine patient visits were made in this clinic during the 24-month period.

II. SURGICAL PROCEDURES

The work in this area has been done primarily by Doctors Schafer, Kittle, and Freisen.

a. *Patent Ductus Ligation.* During this 24-month period, 26 patent ducti were ligated. The ages varied from 8 months to 34 years. No deaths resulted and in this group *no* recanalizations occurred. We felt that the result was excellent in all 26.

b. *Patent Ductus Ligated and Transected.* Two patients who had had their ductus ligated and not cut approximately three years ago were found to again have machinery murmurs. Because of this experience and other such experiences over the country, we have been ligating and transecting the ductus in recent months. During this period, seven such procedures were done on patients from age 2 to 36 with no mortality.

c. *Coarctation of Aorta.* Fourteen patients with coarctation were operated upon during the 24-month period. The ages range from 3 months to 36 years. The cut ends of the aorta could be approximated and sutured in all but one patient. In this single patient, a donor vessel graft was successful.

Three deaths occurred in this group. One, a child, died as the aortic clamps were released, following approximation. The second was a 26-year-old man who died suddenly on the 12th postoperative day, presumably from rupture of the anastomosis, and a 24-year-old woman died suddenly during her 6th postoperative week.

d. *Blalock Procedure* (Subclavian Artery to Pulmonary Artery End to Side Anastomosis). Eight patients with tetralogy of Fallot and one with tricuspid atresia underwent this vessel shunting procedure. The ages varied from 3 to 37 years. No deaths occurred. In recent months, we have replaced this procedure with the Pott's operation (aorta to pulmonary, side to side anastomosis).

e. *Brock Procedure* (Pulmonary Valvulotomy). We did not undertake any operations in this area until the past year. Thus far (until May 1953) we have attempted to open the pulmonary valve eight times in seven patients. In one patient, catheterization following surgery proved that the procedure had not relieved the right ventricular hypertension. We therefore repeated the operation and noted a fall in right ventricular pressure from 105 mm Hg to 35 mm Hg, systolic. Since this experience, we have passed a catheter through the operative wound, during surgery, and established the adequacy of the valvulotomy before closing the incision.

We have had one death, occurring one day postoperatively, from emboli.

f. *Mitral Valvulotomy.* This procedure was carried out 34 times with three deaths. None died during the operation, but expired on the 1st day, 8th day, and 11th day postoperatively.

Eight other patients, besides this group of 34, were explored and, because of either too much regurgitation or the presence of a massive thrombus in the auricle, were simply closed. There was one death in this group.

The oldest patient operated among the total group of 42 was 72 years old. She recovered without difficulty.

The valve could usually be opened by finger fracture; a knife was necessary infrequently. We catheterized several patients before and after surgery, but have abandoned this as an unnecessary procedure. The selection of patients for the operation can practically always be arrived at by clinical means. However, it is impossible to predict correctly the

percentage of regurgitation from physical examination. On occasion, we have hesitated at advising surgery because of what seemed too much regurgitation, clinically, only to find the patient considerably benefited by valvuloplasty.

This operation deserves wide acceptance. It is relatively safe and is the only satisfactory method of treating mitral stenosis. We have become more aggressive in recommending this operation, primarily because we have observed emboli and cardiac failure occur while we were hesitating.

g. *Pericardectomies* (for Constrictive Pericarditis). We have had four patients with classical constrictive pericarditis. Pericardectomy was safely accomplished in each. It is interesting to note that a positive tuberculin test was present in but one.

h. *Aneurysm Repair.* We have attempted the repair of an aneurysm in five patients. Two were wrapped, one evidently successfully. One was grafted successfully. One was grafted and the anastomosis site ruptured on the 21st day. One died on the table.

i. *Smithwick Procedures* (Thoraco-Lumbar Sympathectomies). This procedure was carried out on 16 patients, resulting in 31 operations. The primary disease was hypertension in each case. One death occurred during the second-stage operation; no patients have died since the procedure, although the majority were severely ill prior to surgery. We believe that the area for this procedure is limited, but on occasion it seems remarkably effective in reversing destructive disease.

j. *Lumbar Sympathectomy* (For Peripheral Vascular Disease). Fourteen attempts at removal of the lumbar sympathetics in 12 patients were carried out. No mortality occurred.

k. *Cervical Sympathectomy.* This operation was accomplished in one patient with intractable angina with considerable relief. Another patient, with Raynaud's disease, was also operated upon, also with considerable relief.

l. *Inferior Vena Cava Ligation.* Ligation of the inferior vena cava in an attempt to aid compensation in the presence of protracted heart failure has been advocated by others, particularly Cossio in South America. Considerable skepticism has been expressed in the United States. However, after several animal experiments, we were encouraged to apply the procedure on five suitably selected cardiac patients. All were in severe chronic right heart failure. All had received digitalis, diuretics, sodium restriction, etc., but persisted in massive edema. It was surprising to us to find how well the operative procedure was tolerated by these very ill people. Two of the five have seemed to be considerably benefited with return to near normal life (but with continued strict cardiac management). A third patient benefited immediately with a 30-pound weight loss. She was discharged from the hospital, stopped her medications, used salt, and promptly decompensated. We again successfully diuresed her, and she has remained compensated during the three months we have observed her. A fourth patient seems to be unchanged and still has persistent edema and ascites. The fifth patient was in severe failure at the time of surgery and died the next day.

In judging these results, one must remember that these patients were in marked, chronic right heart failure and had been considered terminal.

m. *Exploratory Cardiotomies.* Eleven patients could be considered as having exploratory operations. Seven of these were operated on because of mitral heart disease, and in all the valve was found to be non-reparable or else a large, fixed thrombus was found in the auricle.

Three patients with continuous machinery murmurs were considered to have patent ductus arteriosus, and no attempt was made to prove the diagnosis by catheterization. Two of these explorations indicated the murmur originated in a high ventricular septal defect; in the third the murmur originated in an opening between a sinus of valsalva of the aorta and the right ventricle. The underlying lesion seemed to be a ruptured aneurysm of the sinus of valsalva.

The 11th patient in the group of exploratory cardiotomies was found to have an inoperable problem (Eisenmenger's complex).

n. *Miscellaneous.* Five miscellaneous operations were done.

(a) pericardial cyst removal
(b) femoral artery embolectomy
(c) repair of a stab wound of the right ventricle
(d) thrombo-endarterectomy for Leriche syndrome
(e) attempted repair of aberrant pulmonary veins.

III. RESIDENTS AND FELLOWS

Each resident in medicine is assigned for a period to the Cardiovascular Laboratory. At present, this is a four-month assignment. During this two-year period, eight residents were on the service (Doctors Neal Jenkins, Joe Stockard, Robert Jenson, Charles Powell, Edwin Slentz, Fethi Gonlubal, Chesterfield Gunn, and Gustave Eisemann).

Special fellows in cardiovascular disease have been trained for periods of one year each. These fellows have been Lawrence Lamb, Mehru Bandorawalla, of Poona, India (sponsored by Rotary International), Dr. Everton dos Marques Santos, Rio de Janeiro, Brasil (sponsored by Institute of International Education), and Dr. T. K. Lin (sponsored by the National Heart Institute).

One man, after completing a year as a fellow with the laboratory, has begun a residency in cardio-

vascular surgery. We hope to stimulate more of our group to do this as we are convinced that the proper training for a cardiologist includes diagnosis and therapy, both medical and surgical. In this field, as in urology, neurosurgery, ophthalmology, etc., the ultimate objective should be to train individuals who are versed in the total aspects of the disease system.

IV. GRANTS AND ENDOWMENTS

The principal support of the unit stems, of course, from the medical center budget. We have been fortunate in augmenting this support with grants and endowments from several areas.

The principal outside support has been from the National Heart Institute, a division of the United States Public Health Service. The institute has awarded the medical center yearly grants for the purpose of developing the undergraduate teaching program. These funds have been instrumental in allowing the laboratory to develop and evolve. Although these funds are primarily available for the development of the undergraduate teaching program, it is apparent that, secondarily, they permit better equipment and more personnel so that every region of the laboratory and of the medical center will benefit. The service of such funds to the entire area is considerable. It is encouraging and stimulating to witness the growth and improvement in personnel and physical plants which the National Heart Institute has accelerated over the country.

During the initial 18-month period, a grant was obtained from the United States Air Force, permitting the transfer of several items of valuable equipment to the laboratory for study and use.

Specific allocations were obtained from the National Heart Institute for the support of experimentation in methods for transmission of electrocardiograms by standard telephone lines, for the investigation of the torsion ballistocardiograph, for studies in experimental rheumatic fever, and in pulmonary disease.

The will of Henry Haskell designated the laboratory as the recipient of $100,000, the interest from which will be used for the support of an annual Agnes Haskell Fellow in Cardiology.

SUMMARY

This is presented as a report summarizing the activities of the Cardiovascular Laboratory during its first two years of operation, May 1951, to May 1953. This is primarily a summary of patient care responsibilities detailing the diagnostic and therapeutic problems. The training of residents and fellows and the sources of support are also described.

UNIVERSITY OF KANSAS MEDICAL CENTER
CARDIOVASCULAR LABORATORY
May 1951—May 1953

	Number	*Deaths*
Consultations	3,766	——
Electrocardiograms	13,546	——
Cardiac Catheterizations	130	None
Angiograms	26	2
Patent Ductus Repair	26	None
Coarctation of Aorta Repair	14	3
Blalock Operation	9	None
Pulmonary Valvulotomy	8	1
Mitral Valvulotomy	42	4
Repair of Aneurysm	5	2
Lumbo-Dorsal Sympathectomy	31	1
Inferior Vena Cava Ligation	5	1
Lumbar Sympathectomy	14	None
Cervical Sympathectomy	2	None
Exploratory Cardiotomies	11	3

Citizenship means that each one of us must know and understand how our government works. We must be willing to study and understand the principles upon which our government is founded. We must know and understand the issues of the day, both local and national. To the extent possible, we must participate in the selection of the officials who govern us and must be willing to serve our government. Our government...will only be so good as those who administer it. We must vote at every election. In other words, we must think, read, talk and work. Work is not the least of these efforts. There is no place for idleness in the American system of economy.—*Ford Q. Elvidge.*

Plans for 1954 Meeting

Plans are rapidly being completed for the 1954 annual meeting of the Kansas Medical Society, to be held in Topeka, May 2-6, with members of the Shawnee County Medical Society as hosts. Various committees have met during the past few months, and in the future will announce arrangements as they are completed.

Dr. Francis T. Collins, president of the host group, is an ex officio member of each committee, and Dr. Charles S. Joss has accepted an appointment as general chairman of the session. Committee chairmen are as follows: Program, Dr. Daniel L. Tappen; EENT Program, Dr. Harold W. Powers; Publicity, Dr. David E. Gray; Skeet Shoot, Dr. R. Dale Dickson; Golf Tournament, Dr. Byron J. Ashley; Banquet, Dr. Richard Greer; Auxiliary, Dr. Robert E. Pfuetze; Medical Assistants, Dr. Harry J. Davis; Commercial Exhibits, Dr. Floyd C. Beelman; Scientific Exhibits, Dr. Robert P. Woods; Luncheon Meetings, Dr. C. K. Schaffer and Dr. Henry S. Blake.

New Member of Council

Dr. Norton L. Francis, Wichita, was appointed councilor of the Sixth District to fill a vacancy occasioned by the resignation of Dr. Clyde W. Miller. The appointment was made at a meeting of the Council held in Topeka on September 27.

Dr. Miller resigned this position because of his having been elected second vice-president, which position places him on the Council. Dr. Francis will serve on the Council until the next meeting of the House of Delegates, at which time there will be a caucus of members of the Sixth District, and the position will be filled in accordance with provisions of the Constitution and By-Laws.

Dr. Francis has been active in many affairs of the medical society. He is currently chairman of the Blue Shield Fee Committee and in the past has served on a number of other committees. He has also been active in affairs of the Sedgwick County Medical Society and in private practice limits his work to otolaryngology.

Cancer Society Meets

Dr. Karl E. Voldeng, Wellington, who served as president of the Kansas Division of the American Cancer Society after the resignation from that office of Dr. Charles H. Miller, Parsons, was elected to an additional full year in office at the group's annual meeting held in Topeka, October 18 and 19.

The following officers were re-elected: vice president, Mrs. Tom Stewart, Wellington; secretary, Mr. J. W. Kirkpatrick, El Dorado; treasurer, Mr. Robert A. McClure, Topeka, and executive director, Mr. W. Miles Pulford, Topeka.

Speaker at the annual banquet at the Hotel Jayhawk, October 18, was Dr. J. Samuel Binkley, Oklahoma City, whose subject was "A Decisive Victory in Cancer Control."

Childhood Accidents

Accidents kill and cripple more children than all the infectious diseases of childhood put together, according to a report on childhood mortality released recently by the Children's Bureau. "If parents understood the accident problem and were as concerned about it as they are about polio and other contagious diseases," the report states, "the toll of childhood death and disability could be cut sharply."

The death rate from accidents among children of ages 1 to 19 was cut only 16 per cent during the period from 1940 to 1949, while the rate for all other causes of death among children of these ages was slashed 46 per cent.

The report cited the following findings for the year 1949. Children under one year of age died from accidents of all types at a rate of 72.1 per 100,000. Home accidents accounted for infant deaths at a rate of 43 per 100,000. Fires, explosions, and burns set a rate of 9.8 per 100,000, and motor vehicles, 6.5. The largest single cause of accidental death in infancy was inhalation or ingestion of objects, with a rate of 28.5. That cause, the report points out, is to be distinguished from "accidental mechanical suffocation," which recent studies show are neither accidents nor due to mechanical suffocation."

Children between the ages of 2 and 4 died from accidents at the rate of 37.8 per 100,000; 5 to 9, 22.3; 10 to 14, 22.7; 15 to 19, 47.2. In the latter group, motor vehicles take the heaviest toll with drowning as the second major cause of death.

"Accident prevention means setting up and maintaining precautionary measures," the report states. "The measures that could reduce accidents are known to family physicians, health officers, teachers, and safety experts. But they can do little until parents are well enough informed to see that the needed precautions are set up and continuously maintained in the home, school, and other places where children are exposed to accidents."

March of Medicine on TV

The second of a series of telecasts on the A.M.A. program, *March of Medicine,* will originate in St. Louis on the night of December 3, reporting highlights of the clinical meeting being held there at that time. The program will begin at 9:00 and will be carried by a network serving this area.

PRESIDENT'S PAGE

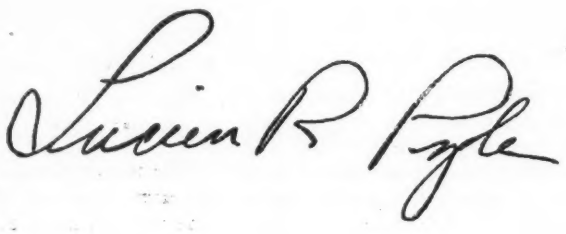
DEAR DOCTOR:

The average physician will raise his eyebrows when he reads the report of the Washington A.M.A. office on medical and health budgets of federal agencies. Even in this era of astronomical appropriations and with the knowledge that the United States has entered numerous facets of the health care picture, one is not quite prepared to expect this process to have reached its monstrous present size. This 11-page closely knit bulletin lists 60 separate health programs pursued by 19 different federal departments at a cost of $1,775,882,197 for the next fiscal year!

Listing them here is impossible, but the following contrasts may be of interest. The Children's Bureau will receive 31 million, Vocational Education 23 million, and $6,250,000 will be allotted to the Food and Drug Administration. The United States Public Health Service operates 13 medical programs, as for example six million for tuberculosis control, five million for venereal disease control, and larger amounts for other services.

National Institutes of Health should flourish in the coming year with the National Cancer Institute receiving 20 million, the Mental Health Institute 12 million, the Heart Institute 15 million, the Institute of Arthritis seven million, and so forth. Of course the armed forces and the veterans' administration are recipients of large grants with more than 747 million going to the latter alone. Almost lonesome among such items as 33 million for hospital care of leprosy patients and narcotic addicts is $2,790,000 for the Bureau of Narcotic Control.

But there it is, for whatever it may mean. In addition to health services from all private and local governmental sources, from insurance, and the various health agencies, the United States today offers health services which, if equally assessed, would amount to $12 annually for each man, woman, and child in this nation.



EDITORIAL COMMENT

State Chamber of Commerce Policy Toward Medicine

The Kansas Medical Society holds membership in the Kansas State Chamber of Commerce and has taken a particular interest in the activities of the chamber's Social Security Council. This council is charged with writing the chamber's policy on all matters relating to social security, a portion of which directly involves the medical profession. In 1949 and each year thereafter, the council has met to review its policies and was in session in Topeka on October 20, 1953.

There are perhaps 25 or more members of this council, including representatives of a variety of business and professional organizations from all over the state. They met all day to discuss the different aspects of social security and took action on a great many separate items. These are then referred to the board of directors and become official policy when approved by the governing body.

A portion of this study relating to medicine has been only slightly altered since 1949 and has been approved and reaffirmed by the board on three separate occasions, the latest being on July 28, 1953. The medical society reported its present opinion, and in each instance the recommendations of the Society were accepted without dissent. The major declarations of policy on these subjects are included below as they were stated during the recent meeting.

The Kansas State Chamber of Commerce has three times previously accepted the following statement on disability insurance and again reaffirmed its policy on August 20: "The state chamber favors a federal disability insurance program for the permanently and totally disabled only, in conjunction with the Old Age and Survivors Insurance program with proper safeguards on government and individuals relative to eligibility and rehabilitation standards. A federal disability insurance program for the temporarily disabled is opposed. Also, the state chamber opposes temporary disability (cash sickness) insurance programs on the state level and urges voluntary group efforts in providing such insurance coverage."

On health insurance the statement is a long one, and only a portion is here included: "The Kansas State Chamber of Commerce believes that the physical health of a nation is the cornerstone of its economic health. Accordingly, the past efforts of this organization in encouraging and supporting health activities of benefit to the people of Kansas, and to the nation as a whole, will be vigorously continued. We urge that other voluntary groups continue and expand all activities holding reasonable promise of further improving the health of the citizens of Kansas and the United States. We do not subscribe to the declaration that there is presently a crisis in the health field. Past efforts toward improving the nation's health, as reflected in mortality statistics and by other evidence, have been amazingly successful. There is every reason to believe that those voluntary efforts will continue to provide such results.

"Efforts to improve the health of the nation should center at the community level—in Kansas as well as in every other state. Accordingly, we urge local businessmen and others concerned to take all feasible steps to support community health activities, including support for local health groups. Businessmen should continue to participate actively in developing the arrangements needed to keep local activities on a sound and an increasingly effective basis."

The previous position of the Kansas State Chamber of Commerce on medical care for the indigent received considerable attention following discussion by representatives of the medical society and the Kansas State Board of Social Welfare. In view of the possibility of some alteration of procedure under this category, the council voted to defer action and requested the medical society and the board of social welfare to prepare briefs on this subject which could be more carefully studied at a subsequent meeting to be called during the winter.

Even though the general subject of government administered compulsory health insurance is not a particular crisis at the moment, the council again endorsed its previous policy on this subject: "The remarkable growth of voluntary, non-occupational prepayment insurance in recent years has been of great value in enabling individuals and groups to meet the cost of modern medical care. Such insurance is now widely available both through the indemnity contracts of insurance companies and through the service contracts of non-profit plans. These voluntary efforts should be encouraged. In particular, communities are urged to participate in prepayment group insurance plans to aid citizens in better meeting their health needs.

"Proposals for government administered health insurance are opposed because:

"1. There is no evidence of a present crisis in the health field. United States medical care is far superior to that of any nation, some of which have compulsory medical care plans.

"2. The term 'free' medical care has been used falsely. With estimates of the ultimate costs of such insurance approaching 8 to 10 per cent of covered payrolls to be split between employer and employee, we believe such costs to be prohibitive. Payroll deductions and payments by self-employed would, if

sufficient to cover the cost, substantially increase the current tax bills of each participant. Failure to meet costs in this manner would necessitate heavy withdrawals from the general treasury, every penny of which comes from the taxpayer's pocket.

"3. Certain abuses of the system by selfish and neurotic patients appear unavoidable with the result of overcrowding health facilities to the exclusion of many of the bona fide sick.

"4. Lowering of the quality of medical care will result from the loss of personal contact between physician and patient—to the end of ultimate loss of the basic ingredients of good medical practice, the human touch. Assembly line techniques and hurried examinations will be coupled with the probability that patients will have no assurance that they will be able to select *and get* the doctor of their choice.

"5. No compulsory health plan can guarantee medical service to all. Only as doctors and health facilities are available and their time can cover all those requesting attention can any plan provide complete medical care coverage.

"6. Such plans would eliminate all citizen initiative in the further development of present organized health services and substitute for it a sterile bureaucratic administrative control inherently in opposition to democratic processes."

Medical Education

The Council on Medical Education and Hospitals of the American Medical Association recently issued two pamphlets, the first listing the approved colleges of arts and sciences in the United States and the second offering information to a prospective student on the choice of a medical school. Both are admittedly incomplete with reference to information about any one school, but each contains a considerable amount of data on the general subject of medical education. A review of this material follows.

The Council on Medical Education was created in 1904 for the purpose of improving the standard of medical training. Its name was changed in 1920. In 1910, the first classification of medical schools was published, together with a formal statement of standards for an acceptable school. These have of course been revised and are now published annually in the *Journal of the American Medical Association* in a special educational number.

Among the specific items of advice to prospective students in the medical schools of the United States is a strong recommendation that the student secure his training in an institution which is recognized by all state licensing boards. With reference to premedical education, no particular courses are specified for high school education. In college, English, physics, biology, inorganic chemistry, and organic chemistry are required by most institutions. Scientific courses must include both theoretic and laboratory work. The student is urged to arrange his program so he will obtain a broad general education, and he should consult his premedical advisors for more specific information.

A list of all approved colleges whose premedical courses are acceptable to the medical schools of this country is available. The Council on Medical Education and Hospitals recommends that students planning to take medical education attend one of these colleges. There are of course many to choose from, as for example 19 in Kansas alone. It is not impossible for the student from some other college to obtain admission to a medical school, but, in a field where there regularly are three applicants for each person accepted, he will find it more difficult to obtain acceptance if his premedical work was done at an unacceptable school. At the present time three years of college training is generally required. For most students, four years is recommended, and only rarely will a medical school admit a student after two years of college work.

The national Selective Service system provides for deferment of certain college students to continue their education. Although premedical students are not separately listed, this generally may be based upon the full time college students who score above 70 on the college student qualification test or who are scholastically above the median of the male members in their first year class of college, in the upper two-thirds of the second year, and in the upper three-fourths during the third year. Continuing deferment is based at least in part upon the certification from the college or, in later years, the medical school, that the individual student's scholastic work continues to be acceptable.

The council recommends that students apply to the medical school of their choice a year before they plan to enter. It is also recommended that candidates consider applying to three or five schools, but it advises against applying to more than that number.

Although facilities have been expanded to meet the increased demand, many persons wishing to study medicine cannot be accepted. Prior to World War II, 6,000 freshman medical students were enrolled. In 1953, there were more than 7,300 freshmen. These were studying in the 72 approved medical schools in the United States. In addition, there are seven approved two-year schools which are qualified to enable the student to take basic science board examinations. These schools also had students not enrolling for the final two years in other schools. Four medical schools in the United States require a year of internship as a part of the medical course. Twenty-six states require a year's internship for licensure, although it is universally recommended.

The required curriculum extends over a period of four academic years and lists 22 specific subjects in which courses must be offered.

The cost of medical education varies greatly, including living expenses, tuition, books, and equipment. It ranges from $900 to $4,500, with a median yearly average of $2,000. The average tuition last year was $633. Even at that figure, tuition fees provide less than one-fourth the cost of operating the medical school, exclusive of the cost of maintaining teaching hospitals. Even though medical education is expensive, it is still strongly urged that the student find means for his support other than through outside work requiring any considerable daily time. Should private resources fail, most schools have scholarships or loan funds available.

The pamphlet also advises that women can and do succeed in the field of medicine. Last year 5.3 per cent of the medical school freshmen were women. They are admitted to all but the Dartmouth Medical School and the Jefferson Medical College. Among the approved medical schools in the country is one, the Woman's Medical College of Pennsylvania, organized in 1850, which exists exclusively for the education of women in medicine.

Until 1950, the Council on Medical Education did not classify any schools outside the continental limits of the United States and Canada. Since then, a very few foreign medical schools have been approved as providing education comparable to that of the Grade A American schools. Since licensure varies in individual states, and because this is the responsibility of the individual board within each state, students should investigate the requirements of those states in which they hope to practice before seriously considering attendance at a foreign school. Almost all state licensing boards require the candidate for licensure to be a graduate of a medical school approved by the council or included in the membership of the Association of American Colleges. Basic science examinations are required in 19 states, the District of Columbia, and Alaska. The National Board of Medical Examiners, organized in 1915, is now recognized as giving an acceptable examination for licensure in all states except Arkansas, Florida, Indiana, Nebraska, and Texas.

The Council on Medical Education and Hospitals of the American Medical Association offers these pamphlets and other information on the subject to anyone wishing to write a request. The address is 535 North Dearborn Street, Chicago 10, Illinois.

Education in Home or Hospital

Physicians are well aware of the fact that each year hundreds of school age children will have their schooling interrupted by illness and physical injuries, and that many others will never be able to attend school because of crippling pathological conditions. These interruptions or denials of school attendance often have a detrimental effect upon the child's mental health and tend to impede the period of convalescence.

For some years, schools have sought to fill this educational gap by sending a teacher into the home or hospital to give individual instruction at each child's particular level of achievement. This procedure has been met with eager approval by the children involved and by their parents and teachers. The success of this type of educational adjustment was recognized by the 1951 Kansas legislature to the extent that funds were made available for this service through the Division of Special Education, State

SERVICE SEPARATIONS

As a service to physicians and communities in this state desiring additional medical personnel, the Journal of the Kansas Medical Society will publish in this column each month the names of medical officers who will shortly be separated from the armed forces. These are men who volunteered from Kansas, and many of them will probably be interested in finding locations in this state. Anyone interested in contacting these physicians may write to the address here given.

John C. Artman, M.D.
2005 Lincoln Drive
Hays, Kansas

Rex C. Belisle, M.D.
Plainville, Kansas

Laurel G. Case, M.D.
316 South Factory Street
Enterprise, Kansas

Thomas W. Critchfield, M.D.
4509 West 74th Place
Mission, Kansas

William J. Kridelbaugh, M.D.
Route 4, Radio Lane
Arkansas City, Kansas

James G. Lee, Jr., M.D.
731 Ann Avenue
Kansas City, Kansas

Hampton W. Shirer, M.D.
5321 West 50th Street
Mission, Kansas

Department of Public Instruction. Since 1951, the sum of $20,000 has been available each year to help the public schools finance homebound and hospital instruction.

Homebound instruction has some obvious limitations. The different types of disabilities permit various amounts of activity during the period of convalescence, with some permitting none whatever. Then too, homebound teaching is limited from an educational point of view. It cannot replace regular school attendance; it can only prevent serious academic lags when the child is well enough to return to school.

During the school year 1952-53, 44 school districts applied for and received state aid under this homebound program. Reimbursements totaling $9,629.42 were made to these school districts and brought qualified teachers to the bedsides of 115 homebound or hospitalized children. Many of these children were brought under the program by virtue of the excellent cooperation given to the Division of Special Education by the Kansas Crippled Children's Commission. The physical disabilities involved, according to the physician's diagnosis for each child, are listed below in rank order, the most frequent causes being listed first: delicate heart condition and rheumatic fever, poliomyelitis, cerebral palsy, epilepsy, kidney infection, muscular dystrophy, spina bifida, bone fracture, chorea, respiratory disease, infectious disease, brain tumor, burns, hernia, incontinence, and allergy.

This is a growing service, and it is believed that many more children will be included under the program during the current school year. State aid was not claimed for some children, and the actual number served in this manner is somewhat above that listed. The goal of bringing instruction to every homebound child in Kansas will not be reached, however, until knowledge of this program spreads to all professional fields concerned. Because of his personal association with physically handicapped children, the physician is in an excellent position to inform parents that this service is available. The parents, in turn, can cooperate with their local school districts in working out necessary details.

The basic points involved in receiving state aid for homebound instruction are as follows:

1. A physician's statement is required, saying that the child's physical condition is such that he should remain out of school for a minimum of three months and also that, in his opinion, the child is able to receive instruction at home or at a hospital.

2. The teacher must hold a valid Kansas teaching certificate.

3. Four dollars per week is paid to the school district for each homebound child receiving a minimum of two hours of instruction per week (on two different days, or as directed by the attending physician).

4. Seven cents per mile is paid for travel actually and necessarily incurred by the teacher up to $50 per child.

5. Necessary forms are supplied by the Division of Special Education. Reimbursement is paid to the school district at the end of the school year.

The regulations under which this program operates prevent the approval of any child other than those who are physically unable to attend school and who are termed as educable. The lower limit of educability has been generally accepted as an I.Q. of 50, although other factors are considered. This service is not intended for those children who have been excluded from regular school attendance because of disciplinary reasons or for reasons of low mentality.

The Division of Special Education would like to encourage all physicians who are treating homebound children as described above to let parents know about this program. If parents or school administrators wish to obtain the complete particulars, they may do so by writing

John H. McCormick, Supervisor
Homebound and Hospitalized Program
Division of Special Education
State Department of Public Instruction
Topeka, Kansas.

New Honor to K.U.

A new honor came to the University of Kansas School of Medicine recently through an announcement that the institution was ranked in first place nationally in the field of postgraduate medical education. That status was won statistically. Postgraduate enrollment in Kansas last year was larger than that of any other school in the nation.

Although the value of education in different schools offers no possibility of comparison, this statistical superiority is revealing. It shows that Kansas physicians appreciate opportunities afforded them for keeping abreast of the latest developments in medicine, that the school is offering courses that are attractive and practical, and that the physicians and the school together are determined to keep Kansas ranking high in all matters pertaining to medicine.

The following tribute to the school was published in the *Kansas City Star*, September 28, 1953.

The up and coming University of Kansas School of Medicine has just received a first place ranking in a field that will benefit more persons than university victories on the football gridiron. It now

leads the nation in the field of postgraduate medical education.

Kansas, second ranked last year, has just passed Minnesota in this endeavor. The rating is by the American Medical association in its annual report on medical education in the United States and Canada. It is based on the number of physicians receiving postgraduate instruction not for degree work.

The Kansas school offered instruction to 2,143 persons in the year ending June 30, the A.M.A. reports. This included postgraduate service to 1,603 physicians, mostly from Kansas but also from twenty-five other states, and other courses to 155 laboratory technicians, 172 nurses and 213 lay persons in hearing, speech and cerebral palsy instruction, all at the medical center.

Training of doctors included 350 taking circuit courses given once a month in eight Kansas cities and two in Missouri; 1,239 attending 3- to 5-day courses at the school, and fourteen taking in-residence training of one month to one year.

The expanded courses follow the university's policy of attempting to make the best in medicine available to all the people. It was fitting that the announcement of the first place ranking should be made by Dr. W. Clarke Wescoe, dean of the school, at ceremonies attending the unveiling of the cornerstone of the new Continuation Center. This building will house visiting doctors, provide a theater for teaching and serve as a student union center—all in the name of further progress.

ANNOUNCEMENTS

A competitive examination for appointment of medical officers to the regular corps of the United States Public Health Service will be held on February 2, 3, and 4, 1954, at a number of points throughout the United States. Applications must be received no later than December 24, 1953. Information and application forms may be secured from the Division of Commissioned Officers, Public Health Service, Department of Health, Education, and Welfare, Washington 25, D. C.

The eighth annual University of Florida Midwinter Seminar in Ophthalmology and Otolaryngology will be held at the Sans Souci Hotel, Miami Beach, the week of January 18, 1954. Lectures on ophthalmology will be given on January 18, 19, and 20, and the following three days will be given over to lectures on otolaryngology. A midweek feature will be the midwinter convention of the Florida Society of Ophthalmology and Otolaryngology on January 20, with a banquet that evening.

The American Academy of General Practice will hold its sixth annual scientific assembly, March 22-25, in Cleveland, Ohio. Headlining the program will be Sir Alexander Fleming, Dr. Howard Rusk, and Dr. E. J. McCormick.

The American Society of Anesthesiologists, at its meeting last month, chose Kansas City as the site for its 1956 annual session.

A three-day institute on emotions and the female reproductive system will be presented at Winter V.A. Hospital, Topeka, December 10-12, by the University of Kansas School of Medicine and the Menninger Foundation. Any practicing physician is eligible to attend, but enrollment will be limited to 80. Information may be obtained from Mr. Harold G. Ingham, Extension Program in Medicine, University of Kansas Medical Center, Kansas City 3, Kansas.

A 16-day medical and surgical congress will be held in South American cities and aboard ship under the sponsorship of the Pan American Medical Association. The group will sail from New York on January 6 and will have stops at meeting points in Caracas, San Juan, Ciudad Trujillo, St. Thomas, and Havana. Dr. Charles Crocker, San Francisco, is executive secretary of the association.

The Sixth Annual Mid-West Cancer Conference will be held at Wichita, April 1 and 2, 1954.

Military Physicians Redistributed

Redistribution to the Navy and Air Force of approximately 500 volunteer doctors recently commissioned in the Army is being undertaken, the Department of Defense announced recently.

The large number of available volunteers is due to the number of physicians who, shortly after the Doctor Draft Act was extended for an additional two years and after the August draft call was announced, decided to volunteer for service now rather than wait until called by their draft boards.

The Navy and Air Force recently have not accepted volunteers since both services temporarily had a number of physicians adequate to meet their needs. Because of scheduled losses, however, these services are now in position to use some of the Army's volunteers.

Insofar as possible, the redistribution will be accomplished by voluntary interservice transfer.

Make hotel reservations now for the annual session, Kansas Medical Society, Topeka, May 2-6, 1954.

Tumors of the Eye

Tumor Conference*

Edited by H. I. Firminger, M.D., and Irwin Joffe, M.D.**

Dr. Helwig: Today Dr. Larry Calkins has kindly consented to discuss tumors of the eye and illustrate his discussion with three cases.

Dr. Calkins: The fundamental classification of most tumors is on a histogenetic basis. The anatomic location and histologic and clinical behavior, however, are qualifying factors, and they are particularly valuable in classifying intraocular tumors. Unfortunately, the histogenesis of most primary intraocular tumors is unsettled. With few exceptions, however, tumors of the retina and of the uvea have been ascribed to neuroectodermal origin.

At one time all pigmented tumors of the uveal tract were believed to arise from branching pigmented cells, probably melanoblasts, which were regarded as of mesenchymal origin. Therefore, they were called melanosarcomas, and in some localities they would still be called that. In the last few years, considerable doubt has been raised concerning the histogenesis of melanomas, and the consensus of opinion, as far as I can find out, now points to the fact that these tumors are not of mesodermal origin; hence, the deletion of the term sarcoma.[1] We now speak mostly of malignant melanoma of the eye—the choroid, the ciliary body, or the iris. Of more recent origin is the hypothesis that melanomas, along with other tumors, may arise from Schwann cells.[2]

Malignant melanoma is the most common intraocular tumor. It is well known that malignant melanomas in the skin arise from nevi that may have remained dormant for years. They suddenly begin to grow and undergo malignant change. In the uvea, as well as in the nevi of the skin, this change is seldom manifest before adult life. The fact that malignant transformation takes place in benign tumors known to have been present for a long time, sometimes from birth, suggests that malignant melanoma arises as a congenital growth, probably from pigment cell clusters or rests.

Once a malignant melanoma has arisen, how do we classify it? Or, more fundamentally, what is the value of classification? Perhaps it gives us an opportunity to prognosticate a little bit and help both the patient and his family. Ordinarily, we divide malignant melanomas into five groups. This is done on a histogenetic basis, and when possible by cells or cell types. Briefly, the groups are as follows.

The most common malignant melanoma is a spindle cell variety. These spindle cells may be divided into two groups, type A and type B. Type A is characterized by a cell with a narrow, oval nucleus and an indistinguishable, or at best barely distinguishable, nucleolus. There is frequently a line or fold extending the length of the nucleus. Type B is a spindle-shaped cell with a more robust oval nucleus and a prominent nucleolus (see Figure 2).

The third group is the fascicular malignant melanoma; and, as the term signifies, it is usually composed of both A and B type spindle cells arranged in a fascicular fashion.

The fourth group is the epithelioid tumor. In this group, the cells are round or polygonal with a large nucleus and a prominent nucleolus. There is abundant eosinophilic cytoplasm and usually a noticeable cell membrane.

The fifth and probably the largest group of tumors is composed of those which are called mixed, simply because each tumor consists of more than one type of cell or pattern. Perhaps 50 per cent of malignant melanomas fit into this group.

As we asked a minute ago, why classify? Well, on a histologic or histogenetic basis alone, the prognosis of malignant melanoma of the eye is materially clarified. For instance, spindle cell tumors, in spindle cell A group particularly, on a rather large series of cases with five-year followup showed 11 per cent mortality, while the epithelioid cell type showed 67 per cent mortality.[3]

There are two other procedures that we commonly employ in the laboratory to help determine the prognosis of the individual malignant melanoma. The first of these procedures is to stain them with a silver stain to study their content of argyrophilic fibers; those which take up considerable silver are thought to be less malignant, and those which take up very little silver, more malignant. The second feature that is commonly used in trying to prognosticate, is the degree of pigmentation of the malignant melanoma. Although this is accorded less weight, nevertheless, it is said by some to be important. Those tumors with the greater amount of pigment are considered more malignant than those with less melanin pigment.[3]

Our first case today is one of malignant melanoma in a 67-year-old white man. While he was in Lima, Peru, he was stricken with pneumonia. He noticed at this time that he had poor vision in one eye. He

* Cancer teaching activities aided by a grant from the National Cancer Institute and the Kansas Division of the American Cancer Society.

** Trainee of the National Cancer Institute.

recovered rather slowly from his pneumonia, and his vision did not improve, and when he finally was seen he was told he had an infection in his eye which, with the treatment for his pneumonia, would be cured. Since the eye failed to improve, he promptly made arrangements to come home. On his arrival in New York, he visited the offices of a prominent ophthalmologist, and very quickly the probability of intraocular tumor growth was brought to his attention. Because of his history of systemic illness, and because the tumor was situated in the posterior segment of the eye, he was examined thoroughly to exclude the presence of an extraocular primary tumor, but no other tumor was found. Enucleation was recommended, but the patient elected to postpone operation until his vision deteriorated to the point where he was unable to see a chart; at that time he was readmitted for enucleation.

Upon gross examination of the enucleated eye, it was noted that the retina covered the tumor completely and did not contribute to the tumor growth. The tumor had intervened between the retina and underlying choroid and had thus brought about retinal separation. This had a mushroom or wheat sheaf appearance which is rather characteristic of these tumors (Figure 1). In some instances, the retina may be eroded by the tumor, but it is not a retinal growth; this is a primary choroidal tumor. Microscopically, the tumor is composed of spindle-shaped cells, and at two points the tumor has broken through the sclera. The retina is intact for the most part, but there is some subretinal fluid, and tumor growth involves the retina at one point. Endothelial lined vascular spaces throughout the area of tumor involvement account for early dissemination of this growth as it spreads by the blood stream. This is primarily a spindle cell A variety, and one can see the linear fold down the center of the long axis of the nucleus of the cell. Figure 2 shows an area of type B cells

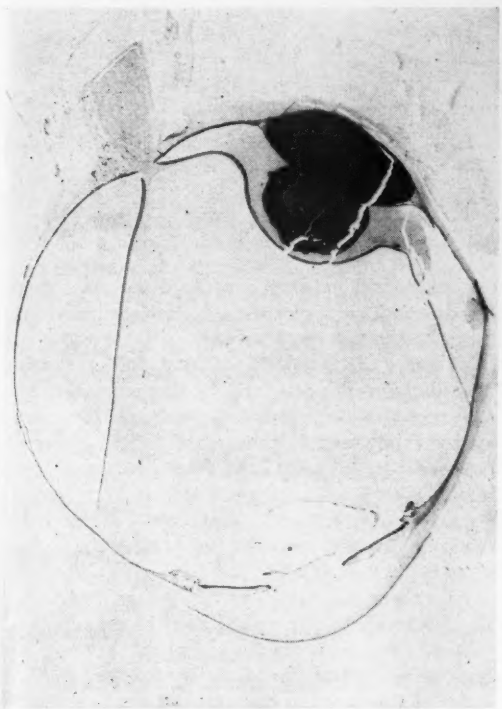


Figure 1. Primary malignant melanoma of posterior portion of eye with collar-button shaped tumor causing elevation and detachment of overlying retina. X 3. Hematoxylin and eosin.

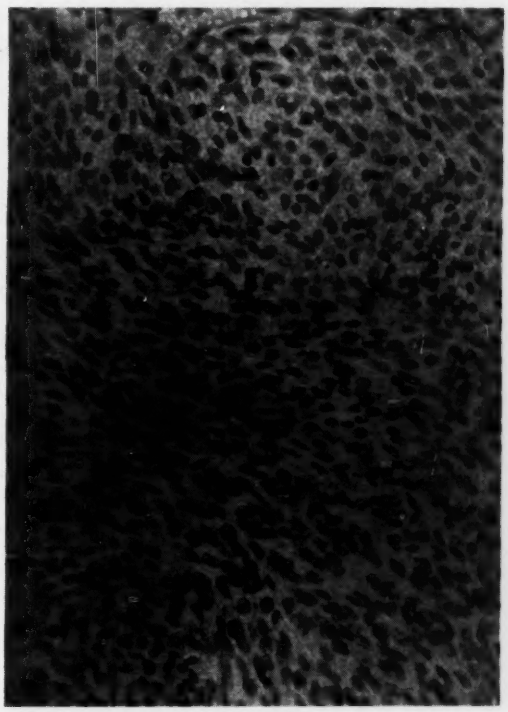


Figure 2. Microscopic pattern of malignant melanoma characterized by interlacing bundles of spindle shaped type B cells with prominent nucleoli. X 235. Hematoxylin and eosin.

arranged in a fascicular pattern; therefore, this tumor would be classified in group 3.

Dr. Helwig: There are only a few points that I think I would like to emphasize, that Dr. Calkins has brought out very well; that is, that the pathologist is frequently asked about the prognosis. And I think we can start out by saying that in melanomas of the eye, generally, the over-all picture is much better than in malignant melanomas arising elsewhere, but the overall picture is a 50 per cent five-year arrest. I believe, as Dr. Calkins has pointed out, one can go even further by studying the cell type and getting even better prognostic outlooks for certain of these tumors. The Wilder stain, as worked out by Mrs.

Wilder some 18 years ago,[4] is still used rather extensively, and when most of the cells show reticulum about the cell the outlook is much better than when there is no reticulum present. It has been postulated that the reticulin might act as a barrier to metastasis into blood vessels.[5] The fact remains that patients with tumors containing abundant reticulum seem to have a somewhat longer survival time.

Dr. Calkins: The next case is an example of the second most common intraocular tumor, stemming from undifferentiated cells of the retina; that is, the retinoblastoma. At one time, such tumors were all called gliomas. This resulted from their location and their manner of growth. When they extended behind the retina they were called exophytic tumors, and when they extended in front into the vitreous cavity they were called endophytic tumors. Those terms are now obsolescent. The endophytic tumors are said to arise from the inner nuclear layer of the retina; the exophytic tumors, similarly, from the outer nuclear layer of the retina. Actually, most of the tumors, when sectioned serially, go in both directions. Synonyms for retinoblastomas now most commonly in use are neuroepithelioma and glial retinoblastoma.

It is essentially a tumor of childhood and is often observed at birth. It usually appears in children less than five years of age. It is extremely rare after ten years of age. There seems to be no sex or race distribution, but familial occurrence is common. One paper[6] points out that more than half the offspring of affected parents show the tumor. I have seen three children out of five in a family afflicted with this tumor. Approximately 50 per cent of patients die within one year of the time of the diagnosis. Death usually occurs from extensions along the optic nerve. We routinely examine sections of the nerve to be sure the tumor has not reached that point. The optic nerve extension progresses to involve the brain, which supports rapid growth of this type of tumor. Retinoblastomas tend to seed intraocular surfaces. This is similar to tumors of the central nervous system, particularly those that involve the brain stem, which may implant in the spinal canal. Retinoblastomas may invade all of the optical tissues, along the nerve, and through the lymphatics, and rarely they metastasize by way of the blood stream.

Our second case is that of A. R., a 2-year-old white boy who, at the age of 14 months, developed convergent strabismus. Fundoscopic examination disclosed an enlarged vein in the retina and retinal separation. The physician immediately suspected an intraocular tumor. Transillumination was carried out and was found to be decreased. This is not necessarily the case in an unenucleated tumor, however; sometimes the transillumination is normal. Enucleation was initially refused, and finally when the boy was 23 months old, because the eye had become red and irritated, the parents consented to enucleation. No glaucoma had developed, but it frequently occurs and is the source of much pain.

Examination of the surgical specimen showed what we interpreted as the origin of the tumor in the retina (Figure 3). Tumor cells were found in the

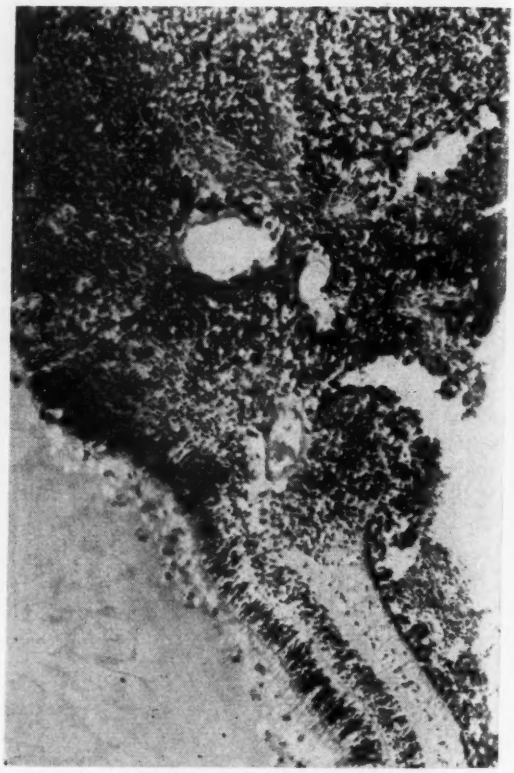


Figure 3. Retinoblastoma arising in the retina with hemorrhage beneath the retina. X–70. Hematoxylin and eosin.

ora serrata and growing down into the optic nerve. Small deposits of tumor tissue were seeded at various points within the eye. Microscopically, the distinctive thing about this tumor is the formation of rosettes. According to Flexner[7] and Wintersteiner,[8] this is an attempt to form rods and cones. In this tumor we see false rosettes characterized by the radial arrangement of columnar cells around a central blood vessel. There are also true rosettes; these are radially arranged cells without a central blood vessel and centrally arranged processes extending through what appears to be an internal limiting membrane.

Another characteristic of these tumors is their rapid growth which may exceed their blood supply, as in this case, with resulting foci of necrosis and hemorrhage. When this tumor is suspected, and if it is far advanced, as in this case, an x-ray of the eye will often show radiopaque calcium deposits in the eye known as Johnson's plaques.

Whereas malignant melanomas extend via the blood stream and seldom, if ever, will extend locally by direct extension, retinoblastomas have many different means of growth. They spread through the eye along the optic nerve, by vascular spaces, by seeding, by direct extension into surrounding structures, and by way of lymphatics throughout that area.

Dr. Helwig: In the case of retinoblastomas, again the pathologist is often asked about the prognosis, and again he can tell these people that a fair percentage of them will survive, possibly as high as 50 per cent, if the tumors are removed early. The question of consanguinity has been brought up regarding this second group of tumors; we do occasionally see cases in which no ancestor, as far as careful genetic investigation shows, has ever had one of these tumors. Certainly it would seem that in a small percentage, perhaps some other factor than a recessive gene may be at work.

I recall when I was in medical school there was a very excellent summary made by Bell[9] in 1922, in which he reviewed all the cases of retinoblastoma that had appeared in the literature up until that time. He presented some case histories that I think are of great interest. In one family, in which no members of the family had had tumors—this family, I believe, had 16 siblings—well over 50 per cent developed it, and investigation of that family revealed a paternal uncle with the disease. So physicians have another duty, that of warning the family about the 50-50 chance, or better, that siblings will develop similar tumors of the eye. I think a doctor who can carry that point at least has discharged his responsibility in preventive medicine.

Would you tell us about the third case, Dr. Calkins?

Dr. Calkins: Although primary tumors of the eye are by far the most common, the choroid of the eye and the remainder of the vascular coat of the eye, namely the ciliary body and the iris, are rather likely sites for the location of metastatic foci of infection or tumors which spread by the blood stream. We know that the brain and the eye are not infrequently locations of single metastatic foci. The explanation that is commonly given is found in a paper by Dr. Batson,[10] who described a paravertebral venous circulation by which tumors from the thorax and abdomen may reach the skull, the brain, and thus the eye without having to go to the lung. Metastatic tumors generally are unilateral; however, several of those present at this conference, I believe, have seen a bilateral metastatic tumor. They appear and grow principally as flat tumors in the posterior segment of the eye. They ordinarily grow around the optic nerve and are readily visible with the ophthalmoscope as metastatic growth, or at least a flat retinal separation. They usually infiltrate laterally. They don't grow forward like the malignant melanoma or the retinoblastoma.

Multiple metastatic sites within one eye also occur: I have seen one eye with three separate foci. Metastasis to the optic nerve is also reported,[11] but it has been quite rare. Occasionally metastatic carcinoma appears in the eye when it doesn't appear any other place. It may occur in the iris, it may occur in the ciliary body, and it may occur in the retina, but for the most part it probably will appear in the choroid or in the posterior part of the eye. Once tumor is discovered in the eye, it is a hard thing to convince a patient that he must lose his eye, when he still has a fair amount of vision remaining in that eye.

Breast and lung predominate as primary sites giving rise to metastases to the eye. The third case serves to illustrate this point. It is the case of a 31-year-old nurse, who, at age 29, had a radical mastectomy for carcinoma. Two years later she reported with poor vision in one eye, and a flat retinal separation was noted. No other metastatic focus could be found, and on this basis an enucleation was carried out.

Microscopic sections of the enucleated eye show a metastatic carcinoma of the breast. It is in the vascular choroid coat of the eye, and the retina is not involved. It extends up to the ora serrata. If you put the sections from the original tumor of the breast and the sections from this mass in the choroid together, they are almost identical. As Dr. Helwig pointed out to me when I was in school, metastatic foci don't necessarily represent the clinical picture or the appearance of the histologic picture of the primary tumor, but in this instance the two are very similar.

Dr. Helwig: I have had practically no experience with metastatic lesions of the eye. I have seen only two in 30 years. Of course I don't examine many eyes. We don't see many enucleations in the institutions where I work. But both of these were metastatic from the breast. One of them happened to be a sister at St. Joseph Hospital, about 25 years ago. It might be mentioned that usually when one encounters metastatic lesions in the eye, it is in the stage of terminal events. However, cases have been recorded in which the removal of the eye was the first sign to point toward the primary lesion, and the primary lesion was discovered after the eye was removed. Or, following discovery, careful search revealed the presence of an unsuspected primary tumor. The breast, the lung, the stomach, the intestine, the thyroid, and the prostate have all yielded metastatic lesions in the eye; and, strangely enough, the left eye is more frequently involved than the right, and usually the temporal side. They are practically all posterior. Bilateral ones, as Dr. Calkins mentioned, have been reported, but I have never seen one. If I had been connected with an eye institute, I undoubtedly would have seen many more.

Dr. Lemoine, would you comment on this unusual condition?

Dr. Lemoine: I can recall one patient with metastatic carcinoma of the eye recognized only after an enucleation. This patient was first seen with a retinal separation and was operated upon without success. After approximately four months, she developed pain with an absolute glaucoma requiring enucleation. Histological study of the eye revealed metastatic carcinoma from a primary growth in the breast.

Metastatic carcinoma to the eye may be more common than believed because terminal carcinoma patients do not have routine eye examinations. In patients with metastatic lesions to the eye, one should consider radiation therapy. We have had several patients who had marked regression of intraocular lesions following deep x-ray therapy. Not only are the lesions reduced in size, but visual improvement frequently occurs. If no other metastatic lesion is found, then enucleation perhaps is the procedure of choice; however, if there are other tissues involved, I feel that radiation therapy is the best form of treatment.

Dr. Boley: Has anyone tried testosterone on patients with metastatic tumors of the breast in the eye?

Dr. Lemoine: I don't think anybody has.

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Study of Blood Pressure

A group of physicians in New York City, working under the auspices of the New York Heart Association, is soliciting information from doctors throughout the nation in an effort to compile statistics on blood pressure in people who are 65 years of age and over.

Questionnaires have been mailed to 17,000 physicians, asking for data on six patients seen recently. Since the names of the 17,000 were obtained from the A.M.A. to secure nationwide representation, a number of Kansas physicians have undoubtedly been asked to help in the study. Those who have not received questionnaires and are interested in assisting may receive information by addressing a request to Blood Pressure Study, 11 East 100th Street, New York 29, New York.

THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL *reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.*

High Priced Pills

It would be interesting to see a "Cost of Being Sick" index, with a comparison of the cost of being sick today with what it was a few years ago.

When father looks over the family bills it appears the cost of being laid up today is two or three times as much as it was only 10 or 15 years ago. Doctor bills are up, hospital charges are substantially more, but the big jump has been in the cost of drugs and prescriptions where pills, powders and lotions are bringing fabulous prices.

Doctors as a group seem to be doing quite well financially, but not many patients find fault with the medic's improved financial status: Only those who have been gigged unmercifully on an operation, those bent on a change to socialized medicine, those poor frantic souls who have been unable to get an unconcerned doctor to make a home call and those who have fretted and fumed for hours in the outer office of the doctor who refuses to make appointments.

But the doctor is a piker in his charges in comparison with the prices of the pill sellers. What has happened to the cash registers on most prescription counters is scandalous, and the sort of thing that makes men listen more attentively and sympathetically to the Loreleis of collectivism. If socialized medicine does come to America anytime soon, the men who have levied the fantastic prices on drugs and prescriptions will be more responsible than the doctors.

Every business man and every professional man is entitled, and should be encouraged, to make a fair profit. But no group of men licensed by the state and limited in number should be allowed to make more than a normal profit. The overall profit in drugs, from the time they are processed and manufactured until they leave the pharmacists' hands,

must be well out of line with the profits in other lines of business. The prescription business seems to be quite profitable generally and, if the big drug manufacturing concerns are not cleaning up, the local pill seller is more to blame. For sure, someone is to blame when six or eight little powdered pills have a price tag of $5, and a simple mix of calomine lotion under a prescription label costs twice what it brings in an original manufacturer's bottle.

Why is it that drugs which are manufactured and packaged by American drug firms are sold in foreign countries at prices substantially less than what they are sold for in any drug store in the United States? The ingredients supposedly are the same, and the package and the label are the same except for a foreign language used in the dosage instructions. The only difference is the price; more at home than overseas.

It is not too uncommon for a sick person to spend a week in a hospital and to discover the cost of his prescribed antibiotics and other drugs is more than the entire hospital bill. Frequently the drugs cost three or four times as much as the amount due the doctor for his care and attention, and yet doctors' bills usually are the basis for arguments for socialized medicine.

Doctors are not blameless. They sometimes own "a piece" of a pharmacy counter where higher prices result in a larger cut for the doctor. That is true with some doctors in Lawrence.

There has been the partially successful fight on self-medication which has directly contributed to the increased cost of being sick. Such proven good products as Cuticura, Resinol, Mentholatum, Pepto-Bismol and aspirin, which are frowned upon by many professional men, cost only a fraction of the charge for the box of powder or tube of ointment issued under the doctor's prescription through the drug store.

Prices of some of the newer "wonder drugs" have remained terrifically high. The drug manufacturing house and the prescription seller usually get the same percentage of profit markup whether the little capsule sells for 10 cents or $1. With the price at a dollar a pill, the seller theoretically makes 10 times as much. And the patient is instructed to take a specified number of pills, regardless of whether they cost $1 or 10-cents each.

A "Cost of Being Sick" index would apply about the same to everybody because 10 aureomycin capsules cost the sick millionaire exactly the same as the poor down-and-outer who has a wife at home with the same infection. The down-and-outer might spend two or three hours trying to save a dollar on his food or clothing purchases, but when someone is sick at his home he doesn't quibble over price. He takes whatever is prescribed at whatever the drug seller wishes to charge.

At the butcher shop the wealthy man buys choice sirloin for $1.10 per pound. The man in more modest circumstances would like to buy a cut off the same loin but his finances are limited. So he buys hamburger at 39 cents per pound. In all of his purchases, clothes, lodging and furniture, he can select according to his ability to pay. But at the prescription counter he pays the same price as anyone else.

He will pay whatever the seller asks for drugs, but he doesn't always like what he is forced to pay. Somehow, he won't argue with his doctor or his druggist like he will argue with his butcher, but he would approve of socializing medicine before he would want to socialize his meat market.

The American Medical Association spends several hundred thousand dollars a year in fighting socialized medicine, with most of the attention directed to the lawmakers in Washington.

The doctors might more wisely spend some of that money in trying to make sure the people of America are getting a fair break on the cost of being sick.—*Lawrence Daily Journal World, September 16, 1953.*

Miracles Come High

The Lawrence Journal-World is aroused over the high cost of being sick. It places the blame on the man behind the prescription counter in ringing words . . .

Such strong statements as these cannot be allowed to pass without dissent. Druggists rarely are encountered in the poorhouse, and I do know one who owns a Cadillac. But he is getting his sixth year of service out of it, and his percentage of markup is what it has been for 30 years.

It is not the pill sellers who are the villains in the piece. The high cost is a part of the new miracle age in medication and of the public's new unlimited belief in miracles.

In scientific, as differentiated from religious fields, miracles come high. Each new wonder drug, whether it is produced as pill, powder, or elixir, when it first is introduced, is manufactured in minute quantities with fabulous unit costs. In addition there are usually fantastic research expenses which must be recovered.

So the first doses of the new painkillers are necessarily sold at prices that tend the purchasers to cry, "Robber." But so great has become the faith in cure-alls that if any new one comes from a reputable source, despite the fact it is still to be mass-tested, many doctors prescribe it. And if the doctors don't, the patients demand it.

Increased and simplified production fast brings down the price of one after another of the cillins, mycins, and moulds. Those who, like the Journal-World, can't swallow the high introductory prices, should swallow a couple of aspirins. In many more cases than not, they would get well just as soon.—*Hutchinson News-Herald, September 18, 1953.*

ACTIVITIES OF MEMBERS

Dr. Ronald Garst, Satanta, left last month for India where he will serve as a medical missionary for the next five years. The work assigned to him is the teaching of orthopedic surgery.

Dr. L. Murray Bowen and Dr. Lewis L. Robbins, both on the staff of the Menninger Foundation, Topeka, were speakers at a meeting of the Mid-Continent Psychiatric Association held in Kansas City late in September. Dr. Bowen spoke on "Psychotherapy in a Guidance Center," and Dr. Robbins described the program of the foundation's day hospital.

Dr. Frederic B. Emery, Concordia, became a fellow of the International College of Surgeons at a meeting held in New York last month.

Dr. Howard E. Snyder, Winfield, was listed on the program of the clinical congress of the American College of Surgeons, Chicago, October 5-9, as a collaborator in a panel discussion on thoracic surgery. Dr. LeRoy A. Calkins, of the University of Kansas Medical Center, took part in the program on obstetrics and gynecology by presenting a paper, "Injuries of the Cervix and Lower Uterine Segment Influencing Abortion." A team from the University of Kansas Medical Center, Dr. Stanley R. Friesen, Dr. Charles H. McCroskey, and Margaret Roady, presented a study on "Wound Bleeding during Experimental Transfusion Reactions in Isoimmunized Dogs."

Dr. Thomas R. Hood, secretary of the Kansas State Board of Health, and Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, were speakers at a recent meeting of the Kansas Tuberculosis and Health Association held in Kansas City.

Dr. Sam Jones and Dr. R. W. Fernie, Hutchinson, announce that Dr. R. M. Jastram, formerly of Minneapolis, is now associated with them in practice. Dr. Jastram is a graduate of the University of Nebraska College of Medicine.

Two Garden City physicians, Dr. L. O. Armantrout and Dr. John W. Turner, have formed a partnership for the practice of medicine and surgery. Dr. Armantrout has been practicing in Garden City since 1937, and Dr. Turner has been there since 1947.

Dr. R. E. Stowell, director of cancer research at the University of Kansas Medical Center, outlined the work of the department at the state convention of Beta Sigma Phi sorority held in Kansas City in September.

Dr. Norman B. Fall, who has been practicing in Winfield for 27 years, has announced his retirement and plans to move to Colorado Springs. His practice in Winfield is being taken over by Dr. R. Burnley White, formerly of Hanover.

Dr. C. Joseph Kurth, Wichita, became president of the Mid-Continent Psychiatric Association at a meeting held in Kansas City in September. Dr. Frank F. Merker, Topeka, was elected secretary-treasurer.

Dr. Winstan L. Anderson, Atchison, recently completed a postgraduate course in surgery at the Postgraduate Medical School of New York University-Bellvue Medical Center, New York.

Dr. Harold Jones, Winfield, described research in multiple sclerosis before a meeting of persons in Iola interested in that disease. The meeting was held in September.

Dr. Andre Baude, Topeka, took office last month as president of the Kansas Trudeau Society.

Dr. C. F. Taylor, superintendent of the State Tuberculosis Sanatorium at Norton, received his student pilot's license last month after his first solo flight.

Dr. William L. Warriner, who has practiced for 65 years, 55 years in Topeka, was the subject of a feature story in the *Topeka Capital* on October 4. He is the only surviving charter member of the Shawnee County Medical Society.

Dr. Joseph D. Noshpitz, chief of children's service at Topeka State Hospital, was principal speaker at a mental health clinic held at Sedan on September 26.

Dr. Murray C. Eddy, Hays, and Dr. Mahlon H. Delp, of the University of Kansas School of Medicine, represented the medical profession as members of a panel which discussed "What Are Nurses Doing?" The discussion took place at a public meeting held in Topeka on October 7 as part of the convention program of the Kansas State Nurses' Association.

Dr. Kenneth L. Lohmeyer, Emporia, is representing the Lyon County Medical Society in the county unit of the American Cancer Society. At the organization meeting held September 29, Dr. Lohmeyer told of the medical society's participation in cancer work.

Dr. Bernard H. Hall, of the Menninger Foundation, Topeka, spoke on "A Sane Mind" before the students of Donnelly College, Kansas City, on October 5.

Dr. Harold F. O'Donnell and Dr. William H. Browning, Wichita, presented a scientific exhibit of plastic renal surgery at the 32nd annual meeting of the South Central Section of the American Urological Association, held in Kansas City, Missouri, September 21-23. Dr. Browning also read a paper, "The Influence of Chem-Therapy and Antibiotics on the Surgical Management of Hydronephrosis."

Dr. Evert C. Beaty, who was recalled to military service at Miramar Naval Air Station, San Diego, three months ago, has been released from active duty and has returned to practice in Parsons.

Dr. James H. Coffman, who was released from service with the Army in September, has begun practice in El Dorado in association with Dr. R. J. Metcalf. He is a graduate of the University of Kansas School of Medicine.

Dr. C. V. Haggman, who formerly practiced in Scandia and moved to Kingsport, Tennessee, recently, was the subject of a feature story in the *Scandia Journal* on October 8.

Dr. Calvert J. Winter, Jr., has returned to the private practice of pediatrics in Kansas City after having spent two and one-half years with the United States Public Health Service.

Dr. John H. Lathrop, Concordia, announces that George Lockett is now associated with him in practice. Dr. Lockett, who has been practicing in Glasco, will continue to be in his office there each afternoon.

Dr. E. Wendell Donald, Caldwell, has gone to Nashville, Tennessee, for a year's resident training in surgery at the Mid-State Baptist Hospital. Dr. Leon F. Kinnan, who has been associated with Dr. Donald during the past six years, will continue to practice in Caldwell.

Dr. R. A. J. Shelley, Coldwater, was in Memphis last month to receive recognition from his alma mater, the University of Tennessee, for having completed 50 years in the practice of medicine.

Dr. Charles S. Hershner, Esbon, who recently visited a number of proctological clinics in Europe, compared the work of those institutions with American clinics at a meeting of the National Proctological Association held in Chicago last month.

Dr. Richard L. Sutton, Jr., of the University of Kansas Medical Center, was co-author of a paper on skin disturbances of the hand published in last month's issue of *Archives of Dermatology and Syphilology.*

The Gelvin-Haughey Clinic, Concordia, announces that Dr. Wayne L. Fowler has joined its staff and will be associated in general practice with Dr. H. B. Stryker. Dr. Fowler, who is a graduate of the Indiana University School of Medicine, had a three-year residency in internal medicine at General Hospital, Kansas City, Missouri, and recently completed a tour of duty with the Air Force.

Dr. H. M. Wiley, Garden City, explained the uses of blood before a community meeting in Garden City last month.

Dr. Byron W. Walters, who has been acting director of the Lawrence-Douglas County Health Board, resigned that position last month when a permanent director was employed, Dr. C. A. McIntyre, formerly of Durango, Colorado.

COUNTY SOCIETIES

A meeting of the Leavenworth County Medical Society was held at Cushing Memorial Hospital, Leavenworth, in September. Dr. Thomas Rankin presented a paper, "Liver Function Tests in Liver Disease." Dr. Carroll D. Voorhees was accepted as a new member.

Physicians from nine counties were present at a meeting of the Southeastern Kansas Medical Society held at the Allen County Country Club, Iola, on September 16. Dr. Harold H. Jones, Winfield, spoke on "Clinical Significance of Hair."

At the business session, the following officers were elected: president, Dr. D. B. McKee, Pittsburg; vice president, Dr. K. J. Bierlein, Pittsburg; secretary-treasurer, Dr. C. W. Erickson, Pittsburg.

Dr. Alfred M. Tocker, Wichita, discussed traumatic injuries of the chest before the meeting of the Cowley County Medical Society held September 17 at the Arkansas City Country Club.

A meeting of the Tri-County Medical Society was held at Harper on September 16 with Dr. L. C. Joslin, president, in charge. Dr. Karl E. Voldeng, Wellington, presented a paper on cancer of the rectum.

The Nemaha County Medical Society held a business session at Seneca on September 23. Dr. J. H. Gilbert reported on a course he had attended in Topeka on the use of radioactive isotopes in medicine. The group later joined the woman's auxiliary for a social hour.

A meeting of the Shawnee County Society was held at the society building in Topeka on October 5. After the dinner a guest speaker, Dr. Edward Tolstoi, New York City, discussed "The Practical Management of Diabetes Mellitus—15 Years Experience." The following seven physicians were voted into membership: Dr. Robert H. Brooker, Dr. George W. Jackson, Dr. William Rottersman, Dr. Robert S. Terrill, Dr. Victor J. Thompson, Jr., Dr. R. C. Anderson, and Dr. George Mrkva.

Members of the Shawnee County Society were hosts at a reception for nurses held at the Hotel Jayhawk, Topeka, on October 8, prior to the annual banquet of the Kansas State Nurses' Association.

Members of the Finney County Society, meeting on September 21, appropriated $100 to Dr. Ronald Garst for the purchase of surgical equipment. Dr. Garst is soon going to India to be a medical missionary.

A scientific meeting of the Sedgwick County Society was held at the Lassen Hotel, Wichita, October 13. Dr. Stewart G. Wolf, Jr., of the University of Oklahoma Medical School, spoke on "A Practical Appraisal of Therapy in Peptic Ulcer and Ulcerative Colitis."

A sports event for members of the society was held on September 18, when the doctors competed in a golf tournament and skeet shoot. The day's program was closed with a dinner and the awarding of trophies.

Members of the Cloud County Society were hosts at a meeting of the Golden Belt Medical Society held at St. Joseph Hospital, Concordia, on October 22. The afternoon program consisted of two scientific papers, "Acid Base Balance" by Dr. John L. Lattimore, Topeka, and "Basic Problem of Biliary Tract Surgery" by Dr. E. R. Gelvin, Concordia. Dinner was served, after which there was a business meeting.

A meeting of the Leavenworth County Society was held on October 12. During a discussion on a proposed new county home, Dr. Adolph R. Mueller was asked to conduct a study of medical needs. All members agreed to participate in the fund drive of the American Heart Association by making talks as requested before civic groups. The speaker of the evening was Dr. Andrew D. Mitchell, of the University of Kansas Medical Center, who discussed urologic problems.

Army Resignations Permitted

Regular officers of the Army Medical Service may resign and leave the service under a new and more liberal Department of the Army policy, according to a recent release from the Office of the Surgeon General.

Beginning with officers having the longest periods of service, a number will be allowed to resign each month, provided they have met certain service requirements. Officers who have no obligatory commitments to the Army and who have served in the Regular Army for a period of three years are eligible for release. However, if they have served for less than eight years, they must accept reserve commissions.

Pamphlets Available from Parke, Davis

A pamphlet containing four advertisements recently published by Parke, Davis and Company, stressing the importance of prompt and proper medical care, is now available from the company. More than 50,000 copies have been distributed. The message of the advertisement cautions against neglect and delay in seeking the physician's help and emphasizes, "In the hands of your physician, you're in good hands."

Mr. Ralph G. Sickels, director of advertising for the firm, said, "We like to think these public service advertisements may be more truly helpful to people than almost any other ad they run across. The messages are the latest in a campaign we started 25 years ago—an effort to make the subject of prompt and proper medical care 'come alive' to the man on the street, the woman in the home. . . .

"We are pleased to get almost daily evidence that these advertisements seem to be nudging people into action—and that the specific examples we are citing about the tragic consequences of delay are helping to generate among people a heightened respect for the professions of medicine and pharmacy."

Support the American Medical Educational Foundation. Contributions are deductible for income tax purposes.

Prognosis in Essential Hypertension*

Richard M. Glover, M.D.**

Kansas City, Missouri

It is the purpose of this paper to examine the literature to determine, if possible, what the life expectancy is in patients having a benign form of hypertension, be it called essential hypertension, arterial hypertension, hypertensive vascular disease, hypertensive cardiovascular disease, hyperpiesia, or just hypertensive disease.

That hypertension may be benign and compatible with reasonable longevity has been recognized and discussed at some length in the literature since 1913, when Janeway[1] published his article. Yet, in the 40 years that have passed, there have been very few articles which have adequate material to give a sound basis on which to build an evaluation of the prognosis in benign essential hypertension.

There are a few basic reasons for the paucity of facts. The very nature of the disease, by its insidious onset and long duration, makes it often impossible to determine the exact date of onset of an elevated blood pressure. It is suggested that the disease has its onest during early life but is not discovered until symptoms bring the patient to his physician many years later. Many other cases are discovered during a routine physicial examination, but in these patients there is again no way to determine when the elevation of blood pressure began.

The long period of time involved with this disease frequently, if not generally, means that one physician does not diagnose and follow it to its termination in a given patient. The patient is seen and moves on to another or other doctors before the end is reached. Often by the time a case is first seen it has reached the terminal stages and therefore gives no true picture of this disease. The picture is complicated further by the inclusion of other diseases or other types of hypertension in nearly all studies found in the literature. The very fact that the etiology of essential hypertension is not known has led each author to set up a different basis on which to present his material. The nature of the disease is such that the family physician usually handles the patients. These men have not, unfortunately, had or taken time to keep complete records or have not individually a significant number of patients to be helpful in the evaluation of this condition.

One of the first extensive follow-up studies to determine the longevity of hypertensive patients was published by Janeway[1] in 1913. His study is a nine-year follow-up of 458 patients, selected from his and his father's practices, who had a systolic blood pressure above 160 mm Hg. The group of patients contained 307 men and 151 women, all of whom came from a well-to-do class and were private patients. At the end of nine years, he found that 46.3 per cent had died and 53.7 per cent were living. Of the men, 53.1 per cent were dead, while only 32.5 per cent of the women had died. He concluded that longevity is better in women than in men when hypertension is present, but that height of blood pressure has very little effect in determining life expectancy. He thought early cardiac symptoms and progressive weight loss tended toward poor prognosis. This paper was of great significance because Janeway was the first to stress the fact that hypertonics might live many years in good health and be completely fit for work, which was contrary to the point of view then held. He emphasized that one should be cautious in predicting a poor prognosis.

May[2] (1925) found, in life insurance reports on 17,760 men and 2,500 women, that 25 per cent of the men and 17.4 per cent of the women had a systolic blood pressure above 140 mm Hg. The mortality increased with blood pressure, so that when the anticipated mortality was put at 100, the mortality was 133.6 at a systolic blood pressure of 141-170 mm Hg., it was 219.6 at a blood pressure of 171 mm Hg. and above, and 827.5 when the blood pressure was above 200 mm Hg.

In 1926, Ehrström[3] published a follow-up study of 252 cases of "nephrosclerosis," finding that the disease on the average lasted 20 years. He stressed that the prognosis is good in the case of essential hypertension, and he mentioned 20 patients who had blood pressures of about 200 mm Hg. for 10 to 16 years and were feeling well. He suggested that the prognosis is poor when hypertension is found in combination with other diseases, especially renal or cardiac disease.

In 1926, Paullin[4] published a follow-up examination of 76 private patients, the number of men and women being equal. He included only cases of "essential hypertension." It should be noted that the average age of the women was about 10 years less than that of the men. After five to seven years

* This is one of 11 senior theses selected for publication by the Editorial Board from a group of 15 judged the best by the faculty of the University of Kansas School of Medicine.

** Thesis written while the author was a senior student. Dr. Glover is now interning at St. Joseph Hospital, Kansas City, Missouri.

the mortality was 54.1 per cent for men and 3.8 per cent for women, indicating that hypertension is more benign in women than in men.

Hamman[5] (1928) reported a 10-year follow-up of 314 patients seen in his office. There were equal numbers of men and women, and all had blood pressures of 150 mm Hg. or more. He found that of 8,000 patients' records reviewed, 778 had blood pressures of 150 mm Hg. and higher (more than 7 per cent). From this group he selected the 314 reported in his paper and found that after two years 10 per cent of the group was dead, after five years 30 per cent were dead, and after 10 years 78 per cent had died. Causes of death were: 30 per cent heart failure, 27 per cent apoplexy, 19 per cent uremia, and 24 per cent unrelated causes.

Blackford, Bowers and Baker[6] (1930) found 401 patients having systolic blood pressures of more than 175 mm Hg. from 19,000 patients examined. Sixty-five per cent of these patients were women, and most of them were 50 years of age or older. In 1932, Blackford and Wilkinson[7] published a follow-up study of 202 of these patients who had been followed for an average of 10 years. They found hypertension twice as frequent in women; however, more than half of the women were free of hypertensive symptoms, while the majority of men had symptoms. Their study showed that of the 202 patients followed, 50 per cent were dead; that 79 per cent of the men had died, while only 42 per cent of the women had died. They discovered that 75 per cent of the deaths were from hypertensive disease.

In 1931, Riesman[8] published an excellent paper in which he discussed the history, theories of etiology, mortality, and treatment of essential hypertension. He felt that of the greatest importance in determination of prognosis was basal diastolic pressure and eyeground changes. He felt that heredity is of great importance and suggested that essential hypertension may be a disease of our "American way of life." He was sure that essential hypertension and reasonable longevity are compatible in many cases in spite of the gloomy picture painted by insurance statistics.

Rice[9] published a study of 327 private patients in 1933, all seen in his office, and concluded from his study that hypertension is twice as frequent in women as in men, but that twice as many men die of hypertension as women. He believes that all hypertension begins as the result of arterial spasm, whether it is produced by environmental stimulation, acute toxins, physiologic disorders, or psychic disturbances. During the first 5 to 10 years these reactions may be temporary. Small injuries to the vascular system may and do disappear, but finally, in the majority of cases, widespread vascular changes take place that make certain a "persistent hypertension." He went so far as to suggest that mild hypertensives may outlive their normotensive brethren because they are under strict medical care which can catch and prevent other diseases such as cancer.

In 1939, Keith, Wagener and Barker[10] published their now famous classification of essential hypertension. This classification has become one of the standard methods of evaluating and classifying hypertensives. It is based on retinal changes found on ophthalmoscopic examination of the eyegrounds.

Group I. Minimal retinal changes consisting in a slight narrowing or sclerosis of the arterioles. Usually benign cases.

Group II. Higher blood pressure and more distinct changes in the retinal arterioles than in Group I.

Group III. Pronounced hypertension, distinct and diffuse sclerotic changes in the retinal arterioles, angiospastic retinitis.

Group IV. Constantly high blood pressure, diffuse retinitis, and, most important, papilledema. These fall into the class of malignant hypertension.

Two hundred nine patients were studied, but the great majority fell into Groups III and IV and, therefore, are of little help in determining longevity in benign essential hypertension.

Daley and associates[11] published a paper in 1943, in which they stressed the importance of the duration of hypertension because of the production of cardiac hypertrophy (left ventricular) and atherosclerotic changes, particularly in the coronary vessels and the aorta. Hypertrophy is related to the degree as well as to the duration of hypertension and usually antecedes significant arteriosclerotic changes. X-ray and EKG are of greatest value in determining these findings and, therefore, the prognosis. In a series of 100 cases, they found cardiac hypertrophy (10 per cent above normal) in 54 per cent of the cases. Evidence of arteriosclerosis of the aorta was present as frequently as enlargement of the cardiac shadow. In the same series they found arteriosclerosis and/or cardiac enlargement in 78 per cent of the cases.

In 1943, Masters and his group[12] published a study of 15,000 persons (8,483 males and 6,366 females) and studied the incidence of hypertension in each decade of life and according to seven classifications based on various blood pressures. They found that at age 60 years a majority of men and at age 50 years a majority of women, are hypertensive. Applying this to the 1940 U. S. white population, they found that 41 per cent of the male and 51 per cent of the female population 40 years of age and over would be expected to have blood pressures of 150/90 or over; at age 50 years and over, the ratio would be 50 per cent in males and 62 per cent in females; at age 60 years and over, 60 per cent in males and 70 per cent in females, and at age 70 and over, 66 per cent in males and 74 per cent in females. It was found that, regardless of classification, the

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1. Greenhill, J. P.: Principles and Practice of Obstetrics, ed. 10, Philadelphia, W. B. Saunders Company, 1951, pp. 103-104; 311; 332.

SEARLE Research in the Service of Medicine

incidence of hypertension rose with each decade of age up through the eighth, and in the case of systolic pressure, up through the ninth decade. Systolic hypertension increases more rapidly than diastolic hypertension, resulting in an increased pulse pressure with age.

In 1946, Poul Bechgaard[13] published a complete and extensive follow-up study of 1,000 hypertensive patients. He found that 71 per cent of his group were alive after a period of 6 to 11 years, with a mortality rate of 288 per cent in men and 143 per cent in women, including cases of nephritis where expected mortality was 100 per cent. He felt that these figures presented too dark a picture of the prognosis of hypertension. It was found that the most characteristic feature, regardless of how the material was arranged, was the fact that excess mortality was considerable in the younger years, but diminished strongly with advancing age, and that the mortality for men was about twice that for women. He felt that, in the young, hypertension must be regarded as having a discouraging prognosis, and that there was little doubt that it represented the renal type of hypertension. He found a mortality of 1800 per cent in cases of chronic glomerulonephritis. He states that we are faced with a sex-difference which causes the circulatory system, both arteries and the heart, to be more strongly attacked in men than in women. He feels that age is of great importance, and he found little difference in prognostic value of systolic and diastolic readings. Myocardial disease gave a serious prognostic sign in hypertension and, contrary to other authors, he found that excessive obesity did not increase mortality but actually tended for better prognosis in his group. He found that 45 per cent died of cardiac disease, 16 per cent from cerebral hemorrhage, and 10 per cent from renal insufficiency; thus, 71 per cent died from causes which as a rule are regarded as being connected with hypertension.

Palmer, Loofbourow and Doering[14] (1948) published their 8-year follow-up study of 430 patients chosen from 1,072 patients. These patients were graded according to the Keith-Wagener classification. After 4 years the mortality was 6 per cent in Grade I, 17 per cent in Grade II, 36 per cent in Grade III, and 80 per cent in Grade IV. They found that patients in Grade IV were younger than patients in the other groups; that patients were older in Grades II and III than in Grade I; that hypertension is more common in women; that Grades I and II are more common in women; that an equal number of men and women were in Grade III; and that more men were in Grade IV. They estimated the 12-year survival rate as follows: Grade I, 58 per cent; Grade II, 24 per cent; Grade III, less than 2 per cent, and Grade IV, almost zero.

In the same year, 1948, Blood and Perera[15] published their 10-year follow-up of 50 patients. They presented a carefully selected group of patients who showed no significant symptoms when first seen, whose initial blood pressure was in excess of 140/90 mm Hg., and who had no evidence of cardiac, renal, or cerebral involvement. Their findings included 82 per cent female and 18 per cent male patients with an average age of 42 years. Among this group were 32 per cent deaths with the majority a result of cardiac complications or following cardiovascular accident. Average initial blood pressure was 182/108, and average last observation was 204/115. Cardiac insufficiency was found among 22 of the 50 patients at some time, usually late in the course of the disease; 39 per cent of these died. Cardiac pain was found in 18 per cent of the patients, with only one of these living when the paper was written. X-ray evidence of cardiac enlargement was present in 66 per cent of the patients, and 33 per cent of these died. Persistent albuminuria was present in 58 per cent, and 27 per cent of these died.

Perera[16] published another paper in 1948, in which hypertension was defined as an abnormal elevation of diastolic blood pressure. He estimated the incidence of essential hypertension as between 2 and 7 per cent, probably about 5 per cent of the adult population. Where there is a clear-cut family history of hypertension, it will be found to be as high as 50 to 60 per cent. Obesity, short and stocky body types, and hyperkinetic body reactions appeared to be present more frequently in association with hypertension. He found it somewhat more common in women, often during pregnancy, and in hyperactive, hostile, aggressive persons who showed emotional lability and anxiety patterns. In his study he found the onset usually in youth or early adulthood and believed that there was a gradual increase in blood pressure. He found headache in 78 per cent, mild retinopathy in 94 per cent, hemorrhages and exudate or papilledema in 19 per cent. Increased cardiac area by x-ray was found in 71 per cent, manifestations of congestive failure in 40 per cent, cardiac pain in 18 per cent, myocardial infarction in 9 per cent, and cerebral vascular accident in 12 per cent. Malignant hypertension occurred in about 5 per cent, most of these patients being men. Cause of death was congestive failure, 40 to 50 per cent; myocardial infarction, 10 to 20 per cent; cerebral vascular accident, 10 to 20 per cent, and insufficiency in not more than 5 per cent.

Burgess'[17] paper in the same year stresses that hypertension, even of an excessive degree, that has been present 8 years or more and is not associated with well established cardiac or renal disease usually does not indicate a poor prognosis. These patients usually live to within 3 or 4 years of their normal

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Although the relationship between iron and hemoglobin formation is widely appreciated, the important role played by protein in hemoglobin synthesis is relatively obscure. Nevertheless, since globin is just as much a component of the hemoglobin molecule as is iron, the continued synthesis of this protein is necessary for normal hemoglobin production.

It has recently been estimated that in the average adult 8 Gm. of globin is destroyed daily.[1] This means "that approximately 14% of the total dietary protein intake of the average adult [female] is required solely for the re-synthesis of new hemoglobin. These data reemphasize the importance of adequate protein, as well as iron, intake for the maintenance of a normal rate of hemoglobin synthesis in man."[2]

Because meat is an outstanding source of *both* iron and high quality protein, it is always recommended in generous amounts in the dietary management of hypochromic anemia. These nutritional values, as well as its significant content of B vitamins, also make meat an important component of the daily diet of normal persons.

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1. Drabkin, D. L.: Metabolism of Hemin Chromoproteins, Physiol. Rev. *31*:345 (1951).
2. The Biosynthesis of Hemoglobin, Editorials, J.A.M.A. *150*:1223 (Nov. 22) 1952.

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life expectancy. He found that the younger the patient at the time when hypertension develops, the less likely he is to live out his full life span. However, even in the young group, the average length of life is over 15 years. He found that such hypertension does not commonly develop into the malignant type, and is not associated with marked arteriolar changes evidenced by retinal hemorrhage and edema or with renal damage. The most frequent cause of death in these patients is cardiac failure, with cerebral vascular accident next. This study did not indicate that the prognosis for males was poorer than for females. It showed that the degree of hypertension is important in relation to the diastolic pressure only, and people with high systolic pressures and relatively low diastolic pressures (the arteriosclerotic type of hypertension) survive appreciably nearer to their normal life expectancy, on the average, than those with high diastolic pressures.

A group study of 241 patients by Ranges[18] (1949) was made of Metropolitan Life Insurance Company employees with hypertensive disease. They were checked periodically over 10 to 25 years and were, for the most part, symptom free and working. There were 130 women and 111 men, and the average age of onset of disease was 39.5 years. Of the entire group, 189 had no symptoms, while 38 displayed diminished cardiac reserve and 5 had headaches attributed to hypertension. EKG's of 148 were normal, while 108 showed left axis deviation; 1, right axis deviation; 9, myocardial infarction patterns; 7, left bundle branch block, and 3, right bundle branch block. Eyegrounds showed 8 normal, 97 Grade I changes, 6 Grade II changes, and 3 Grade III changes. On x-ray and fluoroscopy, 181 showed no enlargement of the heart, 23 had significant enlargement (15 per cent above normal), 24 showed widening of the aorta, and 13 were found to have enlargement of the heart and widening of the aorta. He felt there was no correlation between cardiac enlargement and duration of hypertension. This study is remarkable in that all 241 patients were living at the end of 10 to 25 years.

In 1950, Grant and Groen[19] published an excellent 9-year follow-up study of 418 patients. They found that 127 (31 per cent) of the patients were dead at the end of 9 years; that 25 per cent of the women died, while 40 per cent of the men died. However, these figures include cases of chronic nephritis as well as those of essential hypertension. These authors found that prognosis among their patients most closely paralleled the ophthalmoscopic findings (using the Keith-Wagener classification). Heart disease, albuminuria, and diabetes appeared to reduce the expectation of life, even more for women than for men. Hypertension accompanied by obesity appeared to be prognostically more favorable than the same hypertension in patients whose weight was normal or low. Hypertension in young subjects carried a relatively shorter life expectancy than high blood pressure in old age.

In 1951, Griep and associates[20] published their 8 to 10-year follow-up study of 117 patients. All had blood pressure exceeding 160/110 mm Hg. on two or more determinations and were under 53 years of age. These patients did not have primary renal disease or terminal complications. They found that 46 per cent died from hypertensive complications, 2 per cent from unknown causes, 6 per cent for reasons unrelated to high blood pressure, and 46 per cent were still alive at the end of 10 years. The hypertensive deaths were about equally divided between cardiac and cerebrovascular causes. Uremic deaths were uncommon. Factors influencing the prognosis in these patients were: sex, prognosis poorer in males; initial blood pressure levels, little or no significance; retinal vascular disease, probably a poor prognosis; renal status, when poor, then poor prognosis; effect of age and duration of hypertension, little or none; central nervous system symptoms such as headache and dizziness, did not alter mortality rate; effect of changes in blood pressure, when up, gives poor prognosis, while down is good sign, but usually stayed about the same. Whereas 46 per cent of the series died from hypertensive complications, the normal expected mortality would be 7.8 per cent.

O'Hare and Holden's[21] paper (1942) which followed 100 patients for 10 to 34 years (average 17 plus years), included only patients with "benign essential hypertension." Seventy-one per cent were living when the paper was published, and only 5 of these were in poor condition. Only such conservative methods of treatment as sedation, weight reduction, and general advice were employed. They felt that in making an accurate prognosis, the "basal" diastolic pressures and careful evaluation of the degree of retinal arteriolar sclerosis are of maximum importance. Cerebral vascular accident was the most common cause of death, occurring in 14 of the 29 patients who died, while coronary thrombosis caused death in 8 patients. Age of onset of hypertension ranged from 21 to 68 years, with the average being 45 years. There were 67 women and 33 men included in this group.

DISCUSSION

I have endeavored to present the significant findings from a number of the outstanding papers dealing with prognosis in essential hypertension. Many of the findings and opinions are contradictory, yet only by carrying out these long-term studies can a clear picture of this disease be obtained. When Janeway[1] published his paper in 1913, and found that the prognosis was much better than generally believed,

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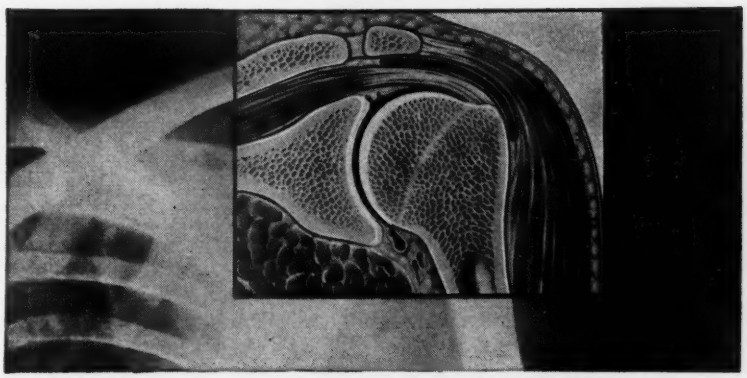

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he set the pattern which has been followed for the past 40 years. Groups of patients with hypertension have been studied from records of hospitals, of private physicians' offices, of clinics, and of insurance companies.

Unfortunately, so much time is consumed in such an investigation if patients are to be actually followed throughout the period of the report, that substitute methods have been used in many cases. One such method is to use hospital records, but here a group of patients is being studied who are often in the terminal stages of hypertensive disease and, therefore, give no true picture of prognosis. At the other extreme is the use of insurance statistics. These groups are selected because they would have been rejected for insurance or required to pay increased premiums or, even more likely, would never have applied for insurance if hypertension was known to be present. On middle ground then come the groups which are made up of ambulatory patients from physicians' offices or clinics.

There can be no doubt that the ideal method is for the same physician to make all examinations, using standardized techniques, over the entire period covered by the study. Probably the greatest single source of conflict between various reports has been the lack of uniformity in choosing patients. As mentioned above, different types of groups will give different results.

It has been found that malignant hypertension is more common in young patients (under 40 years), while a more benign type of disease is usually seen in the older age groups. The younger the patient at the time of onset of disease, the less likely he is to live out his normal life expectancy, yet it has been found that even the young patient has an average life expectancy of 15 years or so.[13, 14, 17, 21] The incidence of hypertension is said to increase with each decade of life up through the eighth, and at age 60 in men and at age 50 in women a majority are hypertensive.[12]

In most papers it has been reported that hypertension is found more frequently in women, often as high as a 2 to 1 ratio. It has also been found that the onset of clinical hypertension is earlier in women than in men.[12] However, the disease is much more benign in women. More men die of hypertension and its complications. Malignant hypertension appears more often in men, but also men do not withstand the stress and strain of benign essential hypertension as well as women. The reason for this is not understood, but the fact seems well substantiated by the literature.

Obesity and hypertension have been tied together in the minds of physicians and public for many years. Yet, it is interesting that few of the papers published have stressed this fact, and two of the better papers have pointed out that, in the authors' findings, obesity gave a somewhat better prognosis.[13, 19, 22] Perhaps this can be explained by the fact that because of the excess tissue between the cuff and vessel when the blood pressure is taken, a higher than normal reading is obtained, and the better prognosis is actually a milder degree of hypertension than the blood pressure reading indicates. This same fact could then explain the fall in blood pressure often obtained with loss of weight, simply that a true blood pressure reading is obtained when the arm becomes more normal in size.

The level of the blood pressure at any one reading has very little significance in determining prognosis of any particular patient. An upward or downward trend to the blood pressure is of more importance but may give false hope or despair. Even in malignant hypertension, it is not the rapidly rising blood pressure alone which gives alarm but rather the appearance of other changes along with the rising blood pressure. There appears to be a gradual rise in blood pressure over the years in many groups of patients, but this doesn't seem marked or significant. The diastolic pressure is of more value in prognosis because it represents the minimal constant strain under which the heart is operating.[27, 28]

TABLE I.

MORTALITY RATES REPORTED BY VARIOUS AUTHORS FOR HYPERTENSIVE PATIENTS CLASSIFIED ACCORDING TO THE OPHTHALMOSCOPIC PICTURE

Author	*Mortality Rate, Percent*			
	Grade I	*Grade II*	*Grade III*	*Grade IV*
Keith and associates[18]	30	46	80	99
Frant and Groen[19]	15	27	60	100
Palmer and associates[14]	10	25	48	90
Smithwick (Post-operative[22] patients)	12	22	40	47

There can be little doubt that eyeground changes constitute one of the best ways of determining prognosis in any individual case of hypertension. Since Keith and Wagener[10] published their classification, the condition of the eyegrounds as determined by ophthalmoscopic examination has become one area of solid ground in the sea of uncertainty which surrounds the subject of hypertension. This is an examination within the scope of every physician who will acquaint himself with the normal fundus and learn to use an ophthalmoscope.

The onset of cardiac complications is generally felt to give a much poorer prognosis. Cardiac hypertrophy, as shown by x-ray and fluoroscopy, is thought to be related both to duration and degree of hypertension.[11] EKG changes which indicate left axis deviation, strain pattern, ischemia, bundle branch block, or infarction are of great importance in prognosis. Exertional dyspnea, pedal edema, and chest pain are the physical signs which go along

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with the x-ray and EKG findings. These are usually seen late in the course of the disease, but may show up at any time. They may be transient but more often are progressive and prognosticate the beginning of the end.

Cerebral symptoms of headache, dizziness, blurred vision, and nervousness are difficult to evaluate because the hypertensive patient with neurotic tendencies can run the gamut. Various authors don't agree on the importance of these findings. There can be no question but that the more severe symptoms are seen usually in the terminal stage of hypertension and, under such conditions, give a poor prognosis.[29]

Renal complications have a great part in the literature dealing with hypertension. From the time of Bright's work there has been much speculation about the renal origin of hypertension. Grollman[24] recently argued that all hypertension is of renal origin, being a lack of production of a hypotensive substance elaborated by the normal kidney. However, this paper is dealing with essential hypertension and assumes no primary renal disease exists in this type of hypertension. There will be changes in kidney function which are secondary to the hypertension, and a persistent albuminuria is not uncommon. These are usually not of primary importance, however, and are nearly always seen late in the course of the disease.

Heredity, familial tendencies, body build and hyper-reactivity have been discussed at some length in the literature, but these are more concerned with etiology than with prognosis once the disease is present, and therefore do not fall within the scope of this paper.[22, 25, 33]

Anxiety, hostility, and frustration are felt to influence this disease and, although these are difficult to evaluate, they must be considered. Several authors have indicated that the proper handling of this aspect of the patient's problem is of prime importance in achieving good results with patients suffering from essential hypertension.[8, 9, 30, 31]

Patients with essential hypertension die most commonly of cardiac disease and cerebral vascular accident, rarely of uremia. In the studies where renal disease was not excluded, a much higher incidence of uremia was found, and if this point is not remembered, a false picture is inferred. Diseases of cardiac origin, congestive failure and myocardial infarction, are probably the most common cause of death,[1, 5, 13, 15, 17, 19, 20, 26, 32] but some papers indicate cerebral vascular accident to be the more frequent cause of death.[16, 21] When these two causes are added together and the deaths recorded as related to hypertension, it is easy to see that an overwhelming majority of patients with essential hypertension die a hypertensive type of death.

A word of caution is justified in regard to deaths from cardiac diseases; it is not uncommon for many older persons without hypertension to die of cardiac disease. It has been suggested that hypertension merely accelerates the death from a cardiac disease which may not be a primary result of the hypertension. There are indications that this is the case because the mortality curve in hypertension, for patients above 60 years of age, is not so very much higher than the general mortality.[13]

CONCLUSION

When confronted with a patient who has an elevated blood pressure, the physician must make every effort to rule out renal disease, endocrine disease, or any other known cause for the hypertension. If the increased blood pressure is persistent and no cause is found, and the diagnosis of essential hypertension is decided upon, the physician must then evaluate the patient's prognosis on the following points. The sex, age, and family history of the patient will give the physician a place to start. A thorough history in order to determine the duration of the hypertension is important. A careful examination of the eyegrounds, cardiovascular system, kidneys, and cerebral circulation is necessary. When all of the examinations and tests are completed, it will, in most cases, be necessary to follow the patient for a period of months or years in order to determine the rapidity with which the disease is progressing.

By evaluating these various findings and keeping always in mind that essential hypertension is a disease which begins insidiously and is apparently slowly progressive over a long period of years, some concept of prognosis can be developed. Since the disease often, perhaps usually, extends over a period of 20 to 30 years, or longer, the physician must think carefully before deciding on any but the most conservative forms of therapy. It is difficult to evaluate this disease because of its long course, so it would be doubly difficult to evaluate the effectiveness of various forms of therapy unless many years were spent in the process.

Today we are confronted with many claims of better results from new surgical procedures, from more potent hypotensive drugs, and from intensive psychotherapy. One must temper these claims with the remembrance that they cannot be proved for years. For example, the surgeon who claims his operation is a great improvement for hypertension because all of his patients are alive and doing well after 5 or 10 years has probably not proved his point, because in essential hypertension it is not unusual for patients to be doing well after 5, 10, or even 20 years when only minimal therapy is employed.

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much better than is generally realized today, and therapy should be in accord with the expected longevity. There is still a great need for carefully prepared and controlled studies of patients with essential hypertension to give us a clearer picture of the disease.

SUMMARY

It has been the purpose of this paper to examine the literature in an effort to determine what the life expectancy is in patients who exhibit a benign form of essential hypertension.

The problems encountered in studying this disease have been briefly discussed. Short summaries of the more important papers have been included, and conclusions are based upon the papers presented.

It was found that: (1) Prognosis is better in women, although the disease is more frequently found in females; (2) the disease is more severe in the younger age groups; (3) eyeground changes and basal diastolic pressure are two of the best guides to prognosis; (4) cardiac, cerebral, or renal involvement tend to give a poorer prognosis, (5) although the disease is more common among obese persons, in them it may be more benign; (6) benign essential hypertension extends over a 20-or 30-year period, and it is suggested that this be kept in mind when therapy is considered.

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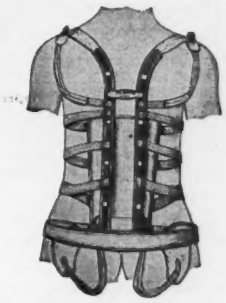

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Some Practical Aspects of the Carrying Out of Multiple Biochemical Analysis of Relatively Small Blood Samples.
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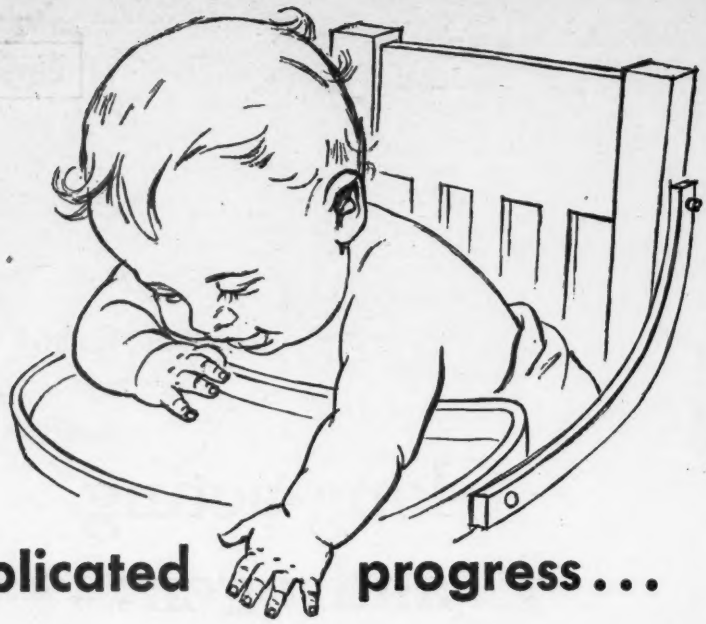

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1. Frost, L. H., and Jackson, R. L.: J. Pediat. 39: 585-592, 1951.

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